AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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"THE BLACK WHIRLWIND"--DIRECTUM.

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DIRECTUM---2:05 1-4.

E. T. RIDDICK.

SEVERAL years ago Mr. Monroe Salisbury, the owner of so many fast trotters, was visiting the farm of "Old Man" Green, in California, for the purpose of looking over his trotting-bred colts, to see if there were any that would do for the track. Mr. Salisbury selected Directum, 2:05¼, the black stallion that is now the wonder of the world. Mr. Green was very much averse to letting Mr. Salisbury have Directum, saying he was only a little runt of a thing, and not suitable for racing; and Mr. Salisbury was compelled to make an agreement to give $5,000 damages in case of loss by sickness or accident before Mr. Green would consent to give him up. Directum is a coal black horse, fifteen and one-half hands, by Director (sire of the champion pacing stallion Direct, 2:05¼), out of Stemwinder by the thoroughbred Venture, and it is claimed that this warm blood is what has enabled him to stand the enormous amount of work given him the past season. His performances have been the sensation last year in trotting circles, and, although it is said that four years of age is the period of formation of the colt into the horse, and that relatively to the three-year-old and five-year-old the four-year-old is in a state of inferiority, Directum has eclipsed all previous records in point of speed, endurance, steadiness and ability to race. Directum has trotted a five-heat race in 2:11, 2:12½, 2:10, 2:10¼, and 2:09¼, a record of the fastest five heats ever trotted in a race, the fastest consecutive third, fourth and fifth heats to the record of any horse, and the fastest three consecutive heats ever trotted by a horse in a race. Directum has a record of six consecutive heats in better than 2:12, with only two days intervening between the two performances, an average of 2:10½ for the lot. When recently shown at the Horse Show in New York, the fifteen thousand people in the building went crazy over him. His action in front one would think almost too high for speed, that is as action is generally understood by breeders of trotters to-day, but the flexion of the shoulder, knee and pastern are simply perfect. The high action, when studied carefully, is seen to be just right to balance his body and keep the center of gravity where it belongs. His powerful quarters and magnificent coupling gives him a reach attained by few horses. It is an exception when he breaks or swerves, and when he does his perfect action enables Mr. Kelly, his driver, "to catch" him, and without loss of time the horse recovers that wonderful stride now so famous. He is a trotter, and knows nothing but trot. There is no doubt that Directum has what is called "a trotting brain." His face is wonderfully intelligent; his eyes, large and prominent, are almost human in their expression, and while like all highly-bred horses, he is nervous and sometimes fractious, he is perfectly amendable to kindness, and his only desire seems to be to please his driver. It is an exception when a whip is used on him when trotting a race; he seems willing to put forth his entire strength and speed to be ahead just from the desire to win, a characteristic so prominent in the thoroughbred horse, and which Directum inherits from his dam. There can be no doubt that his endurance, surpassing that of any trotter of the present day, comes from the warm blood on his dam's side. Let those in favor of trotting blood on both sides for generations say what they please, it is beyond all question that the trotter of to-day, who has speed as well as great endurance, is bred close to thoroughbred blood. He ended last season with defeating Mascott, the pacer, 2:04, Alix, the well-known trotter, 2:07¼, and Saladin, the phenomenal pacer, 2:05¼.

The breeding of trotters to-day is no longer a problem, or the securing of a fast one a chance. It has become a science. The old maxim of "like begets like" is true in every particular, and when breeding on trotting-bred lines, one is almost certain to secure a horse that can go, and go fast. The only trouble with most of the breeders of trotters is that they use anything in the breeding ranks that has speed. The demand among people able to pay the best prices is for a good-sized, well-modeled, strong, even tempered, and level-headed horse, that can trot in 2:30 or better. In order to secure such a horse, the breeders must look more to the beauty of conformation and disposition than they have been doing. It is a difficult job to secure the blood necessary to breed the best, and if one is not enormously wealthy it is almost impossible to do so. To the ordinary breeder of the trotting horse, the advice of an old horseman is entitled to great consideration: "If the trotting-horse breeders will only raise trotting horses with speed, to catch the eye as well as to go along, the secret of success will have been found, and there will never be any more talk of the bottom dropping out of the trotting market. The horse desired to-day in the great cities, where people live who are able to pay the large prices, is one of great beauty of conformation, intelligent, and with the ability to step along in 2:30, or better. Such a horse, well broken and thoroughly trained, will bring from five hundred to one thousand dollars. As it costs no more to raise a pound of horse than a pound of beef or hog, farmers can easily see which is the more profitable."

[In our frontispiece we present an excellent portrait of Directum, drawn and engraved from a photograph on the day after his great mile, in the face of a heavy wind, in 2:07½, over Fleetwood track.]

IMPROVEMENT OF CEREALS.

J. PEDERSEN-BJERGAARD, DENMARK.

Grain crops may, like most other plants be improved in various ways, and the improvement often is so marked as to distinguish the product as an entirely new variety. This is especially not infrequently the case when a cross of different varieties has taken place, either accidentally or by judicious selection of parent plants, the stigmas of the flowers of one chosen variety being fertilized with the pollen of another, taking precaution to prevent self-fertilization. This method of improving grains, or other plants requires a great deal of skill, care and patience, and even when these conditions have been combined, the result will be uncertain. And even in the most favorable case several generations of cultivation, selection, and often repeated and various crossings are required before a new and improved variety can be established. Hence it will be understood that this method of improvement is rather out of the way of the general farmer and must be left to the experts, who will be more likely to fail than to succeed. No wonder that very high prices are paid for new varieties of seeds and grains.

There is another method of improvement which may be practiced by everybody, and which will give certain and good results even in the first crop from the properly chosen seed grain. It is well known that the spikelets of oats contain two, sometimes three, grains of seed of different sizes. The larger of these is denominated the outer grain, the smaller the inner grain. It is owing to this circumstance that a sharp sorting of seed oats is of still more importance and more paying than the sorting of the other cereals. When we take it for granted, as it has been abundantly proved, that the larger grains are most valuable for seed, the importance of a sorting and a sharp sorting of the seed oats will be evident when we consider that one thousand outer grains of common oats weigh from forty to forty-five grams, and one thousand inner grains from twenty-five down to twenty grams, while the percentage of the latter in ordinrry good oats is thirty-five to forty by weight or fifty to sixty by number.

As going to prove the respective value of large and small grains of oats for seed, the following figures, derived from the experiments of the Danish seed-control institution, may be of interest. With equal quantities by measure of seed of common oats sown per acre, the crops grown were for oats sorted to a weight of 45.6 grains per 1,000 grains, 2,398 pounds per acre, qualitative weight of grain 37.0 grams; 36.9 grains per 1,000 grains, 2,410 pounds per acre, qualitative weight 32.1 grams; 23.8 grains per 1,000 grains, 2,215 pounds per acre, qualitative weight 30.8 grams; 15.4 grains per 1,000 grains, 1,989 pounds per acre, qualitative weight 29.4 grams. By sowing an equal number of grains on equal areas (1,500,000 grains per acre), the crops were from seed grain, weighing, 45.6 grains per 1,000 grains, 2,213 pounds per acre, qualitative weight 35.3 grams; 36.9 grains per 1,000 grains, 2,114 pounds per acre, qualitative weight 32.4 grams; 23.8 grains per 1,000 grains, 1,861 pounds per acre, qualitative weight 31.3 grams; 15.4 grains per 1,000 grains, 1,538 pounds per acre, qualitative weight 31.8 grams.

It will appear from these figures that a sharp sorting of the seed oats is productive of increased crops, and a larger, heavier grain, which will in turn produce heavier crops. By continuing a sharp

sorting of the seed grain, it will then be evident that we have a means of increasing the immediate crops of oats and at the same time of gradually improving the quality. Doubtless the increase in straw, so important for oats, will be correspondingly large after sharply sorted and selected seed. The effect of a thorough or sharp sorting of the seed oats becomes still more apparent from the results of experiments in Sweden, under the auspices of Mellersta Sveriges Utsädesföreningen, in which experiments the crops were from seed sorted so as to contain fifteen per cent. inner grain 2,816 pounds of grain per acre; thirty per cent. inner grain 2,352 pounds per acre; forty-five per cent. inner grain 2,240 pounds per acre.

It is not only in the power of the farmer to materially improve the strain or variety of oats he may be growing and increase his own annual crops, but he may make an income by furnishing his less enterprising neighbors with seed oats, sorted, for instance, to a definite average weight per 1,000 grains, which would have a much increased value above ordinary oats. And at the same time he is not only advancing his own income, but he will deserve the thanks of his fellow farmers, who will immediately learn the importance of sowing only the best grain obtainable.

PNEUMONIA IN FATTENING HOGS.

A. G. CHASE, M. D., KANSAS.

It is distressing to the feeder, who has a bunch of hogs nearly ready for market, to have them lie down and die by ones, twos and threes. This is just what we often see of late years in the hog-growing regions. We have "improved" our hogs, that is, we can fatten at any age, and have animals of beautiful contour, but as with all other improved stock, we must give them better care than the old-time animal which ran wild in the woods until two or three years old, was then caught with dogs, put in a high rail pen and fattened. The most common and ordinarily most fatal disease that we have to contend with is pneumonia, especially in late fall and early spring. A neighbor put off a lot of thirty-five head that averaged 315 pounds. He got them through in good condition without loss, and then put about forty head of young animals on full feed to market in April or May. The second lot has been up about two weeks. The weather had been cool and dry until we had three or four days of high wind, first from the north, then it turned squarely south, but it chilled both man and beast to the marrow. In three days some four or five of the young hogs began coughing, and later thumping, were off their feed and feverish. Four or five years ago this same neighbor knocked three young hogs in the head, that were about ready to die, and I made autopsies upon them, all having pneumonia, and he had since lost several head from the same cause. After that he was more careful, and has lost very few. But the main point is, that he recognizes the early symptoms, houses them warmly, and sometimes gives a little medicine.

With certain atmospheric conditions pneumonia is more likely to attack the full blooded fattening hog than the thinner stock hog, and if the attack is at all severe, will prove fatal in a great majority of cases, unless they receive the most careful attention in the early stages. The hacking cough for two or three days, then the thumping, caused by the vain attempt to fully inflate the lungs, frequent drinking if they can get to the water, but later they will not try to rise, but will drink if water is taken to them. The first thing to do is to put them in a warm, dry place, and apply turpentine to the sides all along the ribs twice daily as a counter irritant, and if the weather is very cold, they should be blanketed. If the breathing is very harsh and heavy—what physicians call stertorous, it is better to take a small bladed very sharp knife and scarify the skin in twenty or thirty places on the affected side. (It sometimes, but rarely, affects both sides.) The knife should barely go through the skin to draw blood. Hot blankets, folded over the side, are very useful in this stage, as well as earlier. In most cases the only medicine needed is fluid extract of aconite root to a grown hog, in doses of six to ten drops every two hours. If they will drink, I put about fifty drops in say two gallons of water and let them take that in the course of the day. This is very much larger doses than a physician would give to a person, but I have found that the animal requires larger doses. But if it is given to the hog as a drench so that it is certain to swallow the full dose, four to six drops every two hours, or six to ten drops three times daily, will answer. If this treatment is followed faithfully, three-fourths of the affected animals will recover in three to five days. In fact, I rarely lose an animal when the treatment is carried out. The animal must be sheltered and given some extra care for ten days or two weeks, or until the suppurative stage is relieved by absorption and the lung fully clears up. Aside from the external diagnostic symptoms any one with a good ear can detect the peculiar sound of inflammation of the lung. Hold the ear against the animal's side, and if the lung is inflamed, the sound is like the cracking of new leather when bent. The inflammation may be only three or four inches in extent, or may involve the greater part of the lung; oftener than otherwise I think the lower lobes of the lung, covered by the last five or six ribs. Few breeders are prepared with a proper place to take care of a sick hog, no matter how valuable. But the careful, money-making farmer knows that a hog saved is better than a hog to be raised.

SOME RECENT DAIRY DISCOVERIES.

E. H. FARRINGTON, ILLINOIS EXPERIMENT STATION.

The World's Columbian Exposition was a source of many surprises. This was greatly impressed upon the writer by the many faces he saw within the gates during his daily attendance from April 24th to October 24th, 1893. A never-to-be-forgotten expression of wonder was noticed on the face of a woman who was looking at the representation of the Columbian caravels. She read the names of the craft in which he and his sailors crossed the water and discovered America, and remarked to a friend, "Why, where is the Mayflower? Didn't Columbus come over in the Mayflower?"

It is probable that a proportionally small number of the twenty-one million paid attendants to the World's Fair were interested in the dairy exhibit, but the World's Columbian Exposition Dairy Test supplied its full share of surprises, not only to those who were particularly interested in cows and cow's products, but to the daily visitors. One thing that particularly surprised the writer was the ignorance which so many agricultural visitors displayed in regard to the Babcock milk test. Many had never heard of it. Analyzing and testing milk for butter fat by this simple and accurate process, which came to light in 1889, is one of the greatest discoveries of the age. The test shows quickly and accurately the per cent. of butter fat in sweet, sour, or skim milk, buttermilk, or cream. Sixty different samples of milk can be tested in two hours, at a cost of one-fifth of a cent per test for material, and the process can be easily mastered by almost any one who can turn a crank. Supplied with these advantages the process can be easily demonstrated to be worth its weight in gold.

Nearly every one knows that generally the difference between what is called rich milk and skim milk is in the amount or per cent. of butter fat each contains; hence, the butter fat in milk is for all practical purposes a good measure of its value. Usually the butter fat is only one of the constituents of milk, and of the others the casein is of greater importance to the cheese maker, while the protein substances, as well as the milk, sugar, and ash, are valuable food. But the greatest importance must be ascribed to the fat, not only because it supplies us with butter, but it is also essential for the best cheese. It may be accepted, as a general rule, that milk, rich in butter fat, has a proportionally high content of other solids not fats. Observation has repeatedly taught that cream may be "a delusion and a snare" when it is used as evidence for judging the richness of milk. The following incident illustrates this point: A person using the milk supplied on a city route complained that the milk was poor, almost no cream would rise on it. A chemical analysis of this milk showed it to be slightly above the average composition. This person was accustomed to using milk on the farm where it was subject to no great amount of agitation and set under favorable conditions. The cream rose much differently on such milk than on the milk bought in the city, although there was not much difference between the two milks in the actual percentage of water, solids and fat. We can no more accurately judge of the composition of milk by its color and appearance than we can decide on the flavor of an apple, whose variety is not known, by simply looking at it.

The process referred to for testing the quality of milk can be made of practical value in several ways; it can be used by town and city milk inspectors to guard the consumers, so that in their milk supply fraud will be detected and honesty protected, and at infinitely less cost than by chemical analysis. Any owner of milch cows can make this milk test a very profitable detective in his herd. A pair of scales for weighing the milk produced by each cow and a test of the quality of the milk for a time will furnish evidence by which he can decide, not as a matter of opinion simply, but, as sometimes clearly demonstrated, which cows should go to the butcher and which he should use for continuing his dairy. At the present time the most extensive and important use of this milk test is made at

creameries, and by its use the patrons can be paid for the pounds of butter fat contained in the milk they bring to the factory instead of the pounds of milk only. Selling milk on the "test plan" is a comparatively new thing, and probably a great majority even of the people interested in milk and milk testing would ask for an explanation of the expression. Nevertheless, there is a constantly increasing number of creameries that have adopted this way of paying the patrons for milk, and the honest farmer is beginning to seek, find and patronize them.

Some persons who are particularly interested in butter production have long scanned the horizon for a practical milk test; several have been devised and tried, but I have yet to meet the person who refuses to assign the gold medal to the "Babcock milk tester," and I will briefly describe it. Commercial sulphuric acid or oil of vitriol, specific gravity 1.82, is the only chemical used in this process; such acid can be bought for one and five-eighths cents per pound in carboy lots, and one pound will make about fourteen tests. After the milk to be tested is thoroughly mixed, a glass pipette is filled with milk up to the mark. This measure of milk, about a tablespoonful, is run into the glass test bottle. The graduate full of sulphuric acid is next poured into the test bottle with the milk. By shaking the test bottle so that the two liquids (milk and acid) mix, chemical action of the acid on the milk begins at once, the mixture turns dark to black color and becomes very warm. The milk is decomposed, and the butter fat separated from the other constituents. Centrifugal motion is then used to make this separation complete and to bring the butter fat into the neck of the test bottle where the quantity of fat is measured by the figured scale.

The capacity of the pipette used for measuring out the milk has such a relation to the graduated part of the test bottle that the scale on its neck indicates the per cent. of butter fat; so that milk which contains butter fat that fills the tube of the test bottle from 0 to 3.4 has 3.4 per cent. butter fat. A great many different mechanical devices have been proposed for holding the test bottles and whirling them at a speed of about 800 to 1,000 revolutions per minute. The object of all these different machines is to make complete separation of the butter fat in the test bottle from the hot mixture of milk and acid. When the bottles are in the machine they occupy a position similar to the spokes of a horizontal wheel, the necks of the test bottles pointing towards the hub. The butter fat is the lightest part of the mixture in the bottle, and consequently is thrown towards the center, and accumulates in the neck where it is easily measured. The use of the milk testers is so simple and so satisfactory that it has been well said that every person who has one immediately appoints himself a committee to tell his neighbor.

FUNGI UPON WEEDS—ENEMIES AND FRIENDS.

DR. BYRON D. HALSTED, NEW JERSEY EXPERIMENT STATION.

There are many fungi that prey upon weeds, and so far as this is the case such fungi are the friends of the crop growers, provided that the weeds do not thereby become the means of propagating species which are also parasitic upon economic plants. Thus the common shepherd purse is frequently attacked by a mold (*Cystopus candidus*), which, destroying the stems and flowers, does much towards checking the advance of the weed. At the same time this same mold will thrive upon several other members of the mustard family cultivated for food. It follows, therefore, that a fungus parasite upon a weed is not necessarily an unmixed good. A similar mold (*Cystops Portulacæ*) upon the purslane confines itself to that miserable weed, so far as known in this country, and, therefore, in encouraging it upon the "pusley" there is no danger of causing its wide growth upon cultivated plants. Within the last two or three years the Canada thistle has suffered greatly from the attacks of a rust (*Puccinia suaveolens*). Whole plants become rusted throughout, all their stems and leaves fail to attain half their normal size and die down to the ground at least by midsummer. Other plants may escape for a season and appear in usual vigor while surrounded with those already destroyed with the rust. This fact would seem to indicate that the time of attack is early in the year. The writer has made attempts to inoculate plants by carrying the leaves and stems of rusted specimens to localities where there was no rust, and placing them upon, around and among healthy plants, but with no direct effect. As has been shown in many other cases, it is likely true then that the time for inoculation may be while the plants are small. The importance of the thistle rust cannot be overestimated, for when active it proves the most effective means of eradicating a dreaded pest which threatens the crops over a large area of country. This thought concerning the time when plants are most susceptible, leads me to speak of the observations made upon the rust of the cockle bur. This fungus (*Puccinia Xanthi*) does much more to thin the ranks of this stout weed than all other forces combined. Soon after the seedling weeds are above ground the rust spots make their appearance upon the long, somewhat thick seed leaves. This teaches one, or both, of two things, namely, either that the fungus is already in the seed leaves while packed away in the seedcoats, and only needs to develop when the seed becomes a seedling, or that the thick seed leaves are more susceptible than any other parts of a young plant to the attacks of rust germs. It is also possible that both the above conditions may obtain even in the same seed leaf.

The thought that the germs of fungus diseases are lodged upon the roughened surface of seeds is not a new one, for the soaking of grains, as rye and wheat, for diminishing future smut has long been practiced. The presence of the threads of fungi have likewise been demonstrated within the tissue of seeds, and when the seeds germinated the enemy has grown with them. But nowhere is this better shown than among weeds, and the study of weed fungi has in so far contributed important information concerning the methods possessed by fungi for passing from one generation of their host to another. It is a profitable application of knowledge when it is made to increase the disfavor of an enemy. Weeds are bad enough at best, but when the fact is established that they harbor unseen enemies, the hand of destruction should be raised high against them.

SEEDS AND SEEDING.

If you cannot go to the trouble and expense of hotbeds for starting some early plants for the garden, you can, at least, have a cold frame. One that is six feet square will give all the room that is needed for a private garden, and you will find it a great aid.

The success of the gardener depends largely upon the quality of his seed. Unless you have a separate plot of each item for the especial purpose of growing seed, better buy from a seedsman. Using what happens to be left over from a crop for seed is not good business economy.

Select for the cold frame that spot in the garden where the sun comes earliest and stays longest. A gentle slope will be best. Have a little less depth to the frame at the lower end than at the upper, or a strip of the ground will remain cold. Put on the glass and let the ground get thoroughly warm before seeding. Have the soil rich.

A single planting of peas in the garden is only an aggravation. They are gone before you know it. Plant every week, from the time the ground is dry enough to work. For market you will find that the later plantings pay about as well as the early ones. There is a little time in mid-season when every one has peas in their own garden. Then the market is dull.

SHORT FURROWS.

The man who thinks that any fool may farm, is behind the age.

Good resolutions are all forgotten when a neighbor's pigs get in and root up a piece of newly planted corn for you.

Have a small reserve garden where plants can be grown for a succession, to be transplanted when required to replace such as are out of bloom, or have been lost by accident.

Expecting a cow that stands unprotected in the cold winter blasts to give a large quantity of good and rich milk, is about as reasonable as to look for cream from an iceberg.

In making butter there is no necessity for manipulating it with your hands, as some ignorantly do. A wooden ladle is the proper utensil to use, for working and handling this product.

Memory holds the melodies of the corn-stalk fiddle of childhood more sacred than the most exquisite strains of the master musician that may have for a little while charmed the matured ear.

Do not let a cow run dry progressively unless you really wish to curtail her milk yield. Feel that you can control the volume of her milk secretion by the amount and character of her daily rations.

A good, warm stable is not only an indication of a kind hearted, merciful owner, but it also signifies that he is a frugal and economical man, making practical use of his knowledge that warm shelters are great feed savers.

The little Wood Duck is a marvelous picture of diminutive feather beauty. It possesses a plumage as gorgeous as the most perfect peacock. Its worth to the farmer is largely in its plumage, consequently few keep them on the farm.

TESTING SOILS BY THE COLORS OF THE PLANT FOLIAGE.

W. A. MACDONALD, ENGLAND.

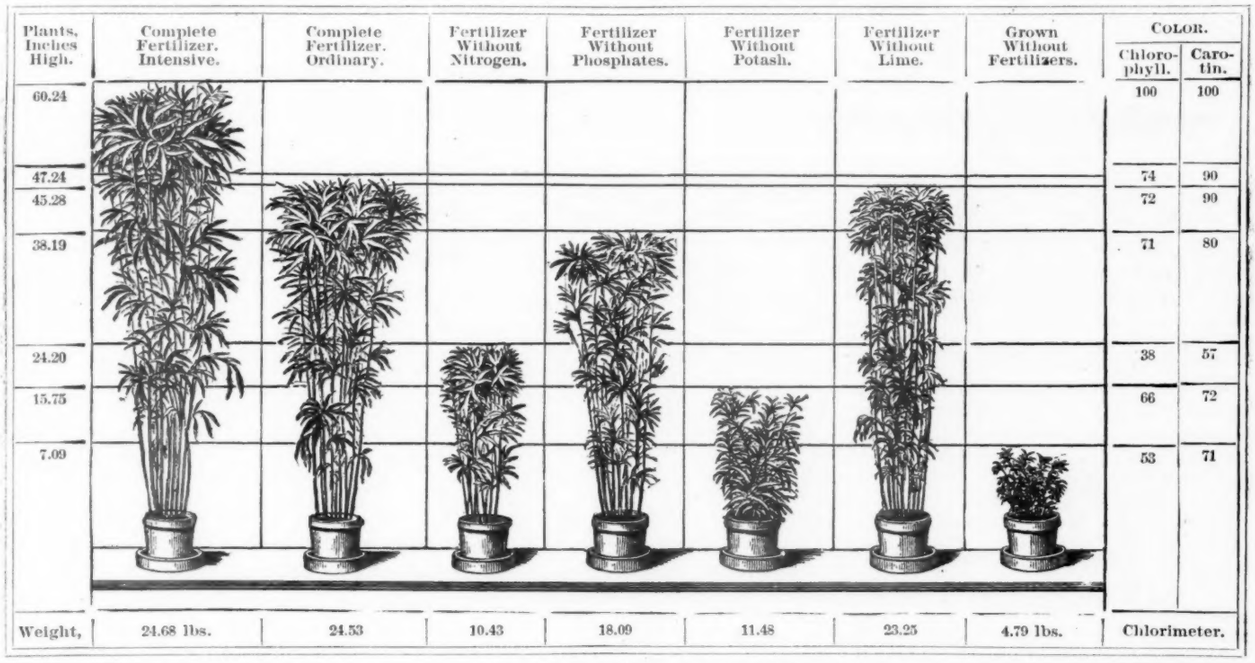
Recent researches conducted by Professor Ville, director of the agricultural experiment station at Vincennes, France, have come to the aid of chemistry in determining the composition of soils. The new process, which has now been the object of Professor Ville's research for over seven years, consists in the discovery of accurate methods of ascertaining the colors of the leaves of the plants grown on certain soils and fertilized in different ways, both the plot and the pot system having been adopted. The plots were not naturally fertile, as the following experiments conducted with wheat crops will show: Plots with complete fertilizer yielded a total of 10.05 tons per acre, giving 43½ bushels of grain; without nitrogen, 4.76 tons with 14½ bushels of grain; without phosphates, 8.31 tons, 26.7 bushels; without potash, 8.30 tons, 31½ bushels; without lime, 9.04 tons, 41.3 bushels; without fertilizers, 3.91 tons, with 12.1 bushels.

Experiments were conducted with wheat, summer rape, beets, potatoes, peas, clovers, grasses, hemp and grapes, thus embracing plants whose predominating food is nitrogen and potash. The nitrogen feeding plants gave more regular results than the potash feeders. Hemp is taken as being typical of the nitrogen group. The color results may be shown by adopting a system of abstract numbers, which will be seen in the last two columns of the diagram, 100 being taken as the deepest shade of green, and the lighter shades being graduated downwards. It will be seen that the lowest or lightest is represented by 38, which is the color of the leaves in the third pot where no nitrogen was applied. The cross lines in the diagram show the relative heights of the hemp plants, the figures being given in the left hand column, the weights underneath, the notations representing the colors being in the right hand columns, and the fertilizers employed being on the top. It will be observed that, in general, the higher and heavier the plant the deeper is the color of the foliage, while the lower and lighter the plant, the paler is the color. The interesting part of the process is the method by which the abstract notations, representing the colors, have been obtained. In fixing these numbers Professor Ville obtained the services of the chemist of Gobelin's laboratory of colors, a manufactory in Paris celebrated since the fourteenth century for its skillful artists of colors and designs in the manufacture of tapestry and carpets. Professor Ville commenced by observing, with the naked eye, the leaves in mass as they remained on the plants, and then also with the aid of an instrument. With the right eye he observed the leaves by the aid of a tube with darkened interior, and at the same moment with the left eye he endeavored to compare the various shades of color with those colored green upon scales of wool having a series of chromatic circles after the method of Chevreul. But he found this process unsatisfactory, as the color of the leaves varied with the condition of the atmosphere, and even with the hours of the day. This difficulty was at length overcome by the discovery that these variations were partly due to the shadow of the leaves above upon those below, and when he separated the leaves from their stems he found astonishing uniformity in the results. He then adopted the chromatic notations employed at manufactory of Gobelin's, which correspond with the direct observations of the leaves.

It seemed, however, that the results by the color scales lacked the highest precision which is possible to be obtained, and, accordingly, he introduced a chemical process by which, instead of directly observing the foliage, he noted the different shades of the green chlorophyll coloring matter diluted in a constant volume of alcohol. Knowing by the labors of Arnaud that leaves contain, independent of their chlorophyll, an orange colored substance called "carotin," which is susceptible of crystallization, and which can be obtained absolutely pure, he commenced to dry the leaves in a vacuum, and then treated them first with petroleum ether to extract the carotin, and afterwards with absolute alcohol to dissolve the chlorophyll. After this second treatment there remained nothing but the dull, colorless vegetable tissue. The solutions thus obtained by equal weights of leaves and equal volumes of alcohol were quite green, but of different degrees of intensity, and corresponded with the results obtained by direct observation of the foliage, with purer and more pronounced shades, however, and in determining the liquids, the chlorimetric method had to be adopted, the chromatic circles not having a progression sufficiently proportioned.

As will be seen by comparing the right hand figures in the diagram, the green chlorophyll and the orange carotin solutions do not quite correspond, but the difference is not so great as it appears, for the results in the carotin column are uniformly higher than the corresponding figures in the chlorophyll columns, with slight exceptions, which may be due to the lack of caution in the process. The results, at any rate, are much more satisfactory than those obtained by the naked eye. Professor Ville maintains that there is a constant relation between the quantities of chlorophyll and carotin, and expects to obtain still more satisfactory results. The characteristic feature of these experiments is that the results can be applied by practical farmers, apart from their interest and utility from the standpoint of agricultural science. In observations made with the naked eye, there is a great difference between observers, due to the varying abilities to distinguish and name colors. Fortunately, however, there are accurate methods for testing the sight. There are also people who can nicely distinguish colors, but cannot easily express them in words. The result as shown in the diagram proves, in general, that a deep green foliage

DIAGRAM OF SOIL ANALYSIS BY THE COLOR OF THE FOLIAGE.



indicates an ample supply of nitrogen in the soil. A light green may indicate a soil lacking in nitrogen or in potash, but as it requires no expert to judge soils which are appreciably deficient in organic matter or nitrogen, little difficulty need arise in arriving at correct conclusions. Intermediate shades, between deep and pale green, generally indicate a want in all the elements of fertility, while a somewhat darker green points to a lack of phosphoric acid. From the chemical point of view, the described method of analysis is a useful aid in determining the quantity of available plant food in the soil, or, rather, the relative percentages of availability of the different constituents, but it cannot be employed in ascertaining the quantity held in reserve.

AIDS IN FENCE BUILDING.

FRED GRUNDY, ILLINOIS.

A person passing along a country road and glancing down many of the lines of fence between the farms and pastures, is often constrained to marvel at their ups and downs and devious windings. Some of them appear to have been built on the trail of a snake, others by guesswork, and still others by mistake. Such fences show plainly that the builders worked without any of the guides or conveniences used by experts, but simply began at one end and wrestled away until they reached the other. It is not quite

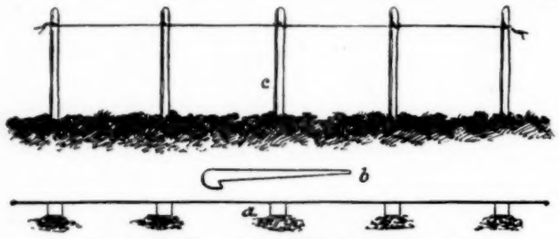


FIG. 1. METHOD OF BUILDING WIRE FENCES.

so easy a matter to run a straight line over uneven ground as many people imagine, and after the line is run it is not easy to follow it exactly, unless one knows just how to do it. And this fact accounts for many of the crooked and uneven fences.

In the first place, guide poles (Fig. 1) should be firmly set at either end of the contemplated fence, then intermediate poles or stakes between these two, not to exceed one hundred yards apart. For these intermediate stakes plastering laths answer every purpose. A person standing a hundred feet from one of the end poles can direct the setting of these stakes so that the job can quickly be done. Next, a line, *a*, that will not stretch much, and is long enough to reach from one stake to the next, should be laid down perfectly straight, and pinned fast every fifty feet with small, hooked stakes, *b*. Then with a light pole that will reach the exact distance the posts are to be set apart, to measure with, the holes can be marked by cutting a straight edge along the line, *a*, first and throwing the earth outward. When the holes are thus marked, the line may be taken up and the digging proceed, the digger being careful not to gouge the straight edge in the least, because that will be the main guide in setting the posts. It will not be difficult to set the posts in a straight line in holes dug in this manner.

After the posts are set attach the boards or wire. If the ground is rough the line should be strung along the posts, *c*, an inch above where the top board or wire is to be attached, and hung there on small nails driven just far enough into the posts to hold it. The line being in plain sight, it is easily adjusted so as to make a perfectly even fence. After the top board or wire is on, the holder, *d*,

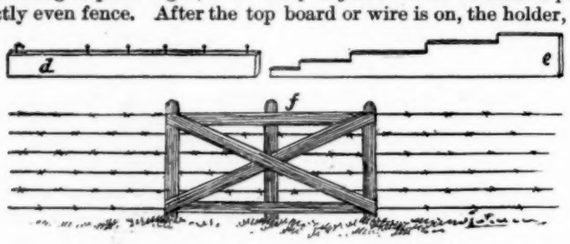


FIG. 2. SECURE BRACE FOR WIRE FENCES.

(Fig. 2) is used for adjusting all below it. This holder is a light strip of wood having a hook near one end, by which it is hung on the top board or wire, and iron or wooden pins, placed at proper intervals, upon which the boards or wires rest while being fastened. In putting up wires alone, I have sometimes found it best to hang the holder on the top wire close by the post, and mark the places for the remaining wires with blue chalk. This can be done rapidly, and then the wires can be attached without further measuring or

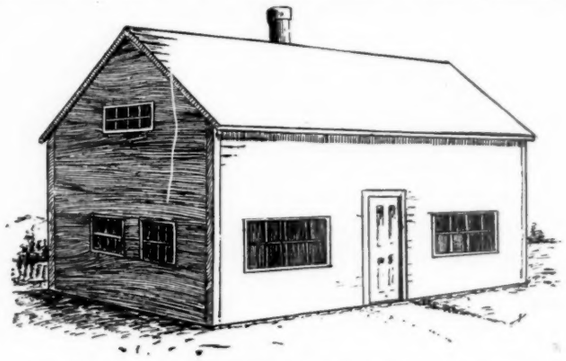


FIG. 1. PERSPECTIVE VIEW OF POULTRY AND PIG HOUSE.

sighting. By using it to hold one end of the boards, one man can nail them on without any assistance. Another form of holder and marker, *e*, for use on comparatively level ground, is set on the ground close by the post, and the boards or wires rest on the steps. It will be found very useful where it is desired to have the lower boards or wires run even, and at equal distances apart. For bracing a wire fence, either at the corners or at intervals along the line, I know of no better method than boards nailed to the posts, *f*. These make a firm, solid brace that will hold the fence stiff without lifting the posts out of the ground, as many of the old style post braces do. The brace should be placed at intervals of about two hundred yards along the line. If this is done the wires may be drawn tight, and will remain so for many years.

COMBINED POULTRY AND PIG HOUSE.

Where one desires to make a single building serve for the accommodation of both swine and poultry, he may find some suggestions in the accompanying illustrations. This house has two pens for fowls and two for pigs, an ample hall between the two, a

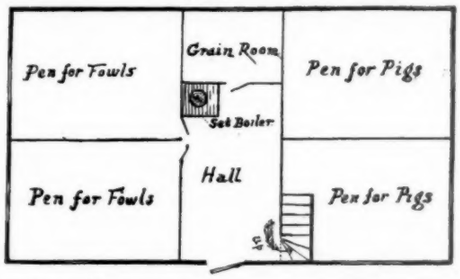


FIG. 2. GROUND PLAN OF COMBINATION POULTRY AND PIG HOUSE.

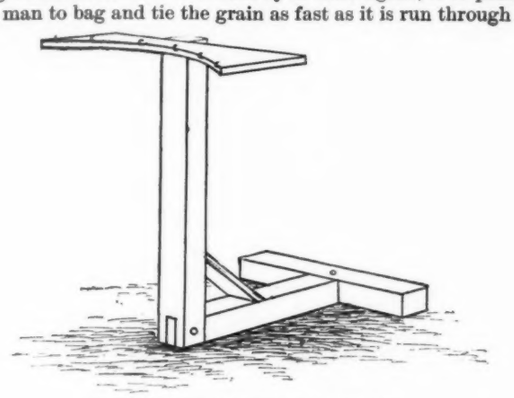
set boiler for cooking food, and a grain room. If the nature of the location permits it, a cellar beneath the building could be utilized for the storing of roots, which might be made to serve as a large factor in the food of both fowls and pigs. The loft above provides room for sitting hens, while one end may be used as a pigeon house, if these most interesting pets are kept for the delight of the children upon the farm. Yards may be arranged at either end, for the comfort of both the feathered and the porcine inmates. In Fig. 1 above is seen a perspective view, and in Fig. 2 the ground plan of the very convenient combination building.

Free the Walks From Snow.—After every snow storm the walks and paths should be cleared of snow, which should not be allowed to remain until trampled down so firm that its removal is difficult. If in an exposed situation, throw the snow upon the opposite side from which the prevailing winds blow, for if upon the other side, the winds often fill the path as high as the bank is made, entailing more work at the second clearing. For handling light snow, the common snow shovels are best, while snow that is firmly drifted or trampled, nothing is better than the common scoop shovel. Where long stretches of walks are to be cleared, a light scraper of two boards on edge and meeting in front is best, and is readily drawn by two men. It pushes the snow equally to the sides. Where snow

accumulates upon the roofs in large quantities it should be removed, as a thaw invariably clogs up the gutters, and freezing fills the pipes, overflowing at important points to the inner walls.

A HOMEMADE BAG HOLDER.

By the use of a bag holder, constructed as shown in the accompanying illustration from a sketch by S. Barrington, it is possible for one man to bag and tie the grain as fast as it is run through the

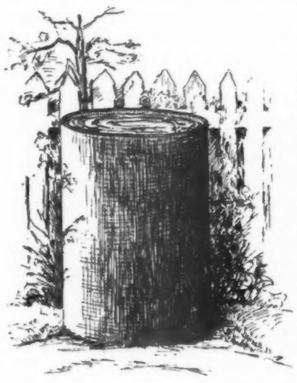


DEVICE FOR HOLDING GRAIN BAGS.

fanning-mill. This contrivance is a very easy thing to make, and will pay upon every farm. The one in the engraving explains itself. The most important point to be considered is to make the foundation blocks of 4x4 inch heavy timber to prevent upsetting. Instead of the complete arrangement, simply the bag-holding circle can be made, and hung along the side of the granary, or to the mill, or any other upright surface.

SERVICEABLE ROADSIDE WATERING-PLACE.

Streams from near-by elevations frequently cross or run parallel with highways, from which elevations, pipes can be laid to the side of the roadbed. This gives a head of water that will not only cause it to rise in a trough, so that a horse may be watered without unchecking—a great convenience—but will also afford such a movement of the water, if the inlet is rightly arranged, that ice will not form, at least over the entire surface, even in extremely cold weather. An excellent roadside watering trough can be made by taking a section of iron sewer or water pipe, two feet or more in diameter. This, of course, will have no bottom, and one must be made in the foundation that is provided, which should be of rocks, gravel, sand and, if necessary, cement. A supply pipe and a waste pipe must enter the trough through this foundation, the supply pipe being carried up on one side of the trough nearly to the top, and its upper end bent at a right angle, so that the inflowing water may form a constantly flowing current around the circular inclosure. When this iron trough has been placed in position on the foundation prepared, the space which it incloses at its base may be cemented, after which fine, clean sand should be filled in for six or more inches. A sufficiently tight bottom may perhaps be made by tamping in a foot or more of sand. The greater the force with which water enters such a trough the stronger will be the circular current within, and the less likelihood will there be that the surface will freeze over.

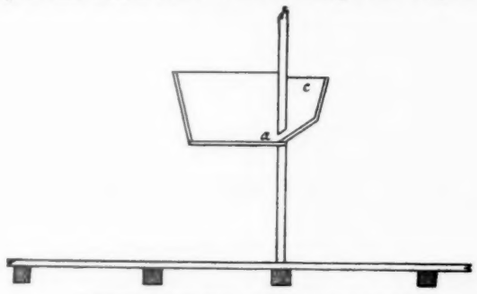


IRON PIPE WATERING TROUGH.

Train Children to Use Tools.—Every farm should have a workshop in which to work in winter, and on stormy days. A vast amount of work can be done during the winter, which would be left undone without a place to work in, or be paid for at high prices if a carpenter is called in. Such a shop is a good place in which to train the boys. Give them a place to work in, and tools to work with, encouragement to go ahead, and commendation for successful jobs, and they will soon be able to attend to all the rougher parts of repair work necessary to be done on the ordinary farm, and very likely some of them will develop into first-class carpenters, architects, or machinists. If such a workshop does not exist on the farm, a great deal of the work that can be done in putting farming tools in good shape for spring use, during the winter, will be left undone, because there is no convenient place in which to work. Build a shop, by all means, and devote the stormy days of winter to getting everything in the machinery line in first-class working order, before the coming of spring.

A SLOW-FEEDING BOX FOR VORACIOUS HORSES.

Many horses are such rapid eaters that much of the oats and other grain enters the stomach without being broken, and consequently passes off undigested. The feed box illustrated herewith, which has been planned by L. D. Snook, obviates this difficulty. The improvement consists in simply attaching a small box, *c*, to the outside of a common feed box, a slot being cut into the feed box proper, at *a*. It is plain that grain placed in the box *c* will follow the inclined bottom of the box, and gradually fall into the feed box, but only as fast as it is removed from the aperture *a* by the animal



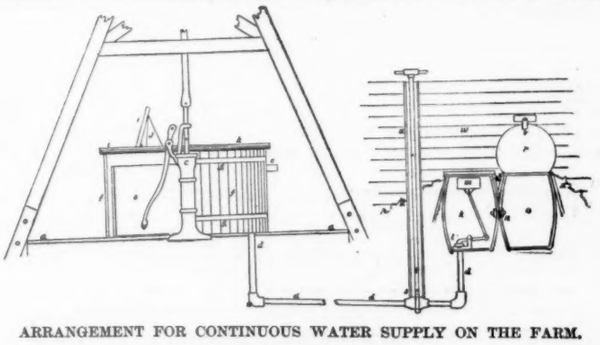
FEEDING BOX FOR VORACIOUS HORSES.

feeding. It is a simple and very effective arrangement, and should find a place in many stables. It saves grain by causing the animal to feed slowly, without throwing the grain, as many horses do.

PRESERVING THE NATURAL TEMPERATURE OF WATER FOR STOCK.

J. WHILDIN, KANSAS.

On the prairies of North America the wind is used on almost every farm for pumping water, and windy as the Great Plains are, the wind is inconstant, and calms are frequent. In order to keep up a continual supply of water for live stock, reservoirs are used, which are usually made of plank in the form of a tub or box, open at the top, and placed in the barnyard or feed lot, where the stock drink directly from them. Sometimes the well and pump are also placed in the barnyard, but more frequently they are near the house, and the water is conducted to the tank in pipes generally placed under ground. While this plan has many advantages, it also has some objections which may be readily overcome. One objection is the difficulty of obtaining from the stock well the water



ARRANGEMENT FOR CONTINUOUS WATER SUPPLY ON THE FARM.

for house use. Even where the well is near the house, whenever there is not sufficient wind to pump, it is necessary to detach the pump rod and attach a handle, and pump by hand the water needed for domestic purposes. If needed pure, one must empty the pump of its standing water before fresh well water is obtainable. Another objection is the great surface of water in the tank exposed to the atmosphere, in summer making it hot and filthy with green moss,

scum and other impurities, and in winter almost constantly covered with ice, which has to be chopped out daily to permit the shivering stock to quench their thirst with the ice-cold water.

The writer has adopted a system of watering stock which obviates both these difficulties. The well is close to the kitchen. The windmill tower spreads twelve feet at the base, as all windmill towers ought to, and if very high they should spread wider, to guard against their blowing down. The platform, *a*, on preceding page is twelve feet square, one side of which supports a tank made in cylinder form of galvanized sheet iron, thirty inches deep and six feet in diameter, a part of which is shown at *b*. The pump, *c*, stands in the middle of the platform, with the spout passing just over the edge of the tank. A waste pipe, *e*, made of one and one-half inch pipe is attached near the top. Two thicknesses of felt paper were then wrapped around the tank, and tied in position by a small, stout cord. Straight board staves one by four inches, and three feet long, were placed upright around the tank, a part of which are shown at *f*, and held in position by two hoops, *g*. The staves are built all around, but it is necessary to show a part of them removed, to give a view of the tank inside. The whole is covered by a lid, *h*, made of two thicknesses of inch lumber lying transversely. It stands six inches above the tank, to allow the spout to pass under. A part of the lid at the side next the kitchen is hinged, opening back against a rest, *j*, for dipping out water. The discharge pipe, *d*, one and one-half inches in diameter, is covered with a strainer, and goes straight down three and one-half feet, where it turns and extends one hundred and fifty feet at a moderate fall to the barnyard, retaining its depth three and one-half feet below the surface of the ground, until it rises in a barrel, *k*, through a float-valve, *l*, which is operated by a float, *m*. To the side of this barrel is attached, by a hollow nipple, *n*, another barrel, to which is attached yet another barrel, back of this. These are common kerosene barrels, sunk half way in the ground, and surrounded by 1x4 inch staves driven in the ground, and held in position by a hoop at the top. All the barrels have lids made of two thicknesses of inch lumber; those of the latter two, *p*, are hinged to a board fence, *w*, separating two feed lots. These lids are fastened back against the fence, when open, with a button, *v*. A tap, *s*, is used to shut off the water, when it becomes necessary to empty and clean the barrels. It is operated from both yards by a rod, *t*, passing up to the top of the fence, and is protected by a wooden box, *u*, the top of which is braced to the fence, and the bottom is planted in the ground. A mound of earth, *x*, is kept heaped around these barrels. Wherever pipe is attached to the tank or barrels, two lock nuts are used with rubber packing. The barrel, *k*, is solely for the purpose of protecting the float; the water it receives from the pipe, *d*, passes through the nipple, *n*, to the two barrels, *o*, where it supplies stock on both sides of the fence. These barrels are kept closed in cold weather, except in the middle of the day, when they are left open for the stock to drink. By occasionally cleaning the windmill tank, the water is always pure. The supply being ample, by pumping to frequent overflowings, it is always fresh and of nearly uniform temperature, never freezing in winter, and so cool in summer that it is used for cold storage. Milk, butter and fresh meat are sealed in glass fruit jars, and sunk in the tank. When wanted for use a long wire hook is lowered in the water and caught in loops soldered on the cans to lift them by. Pure, fresh water is always ready for house use. All that is necessary is to open the hinged lid and dip it out. The pipe conducting the water to the barn being so deep, and the barrels receiving it being so well protected, ice seldom forms on them, and then only a thin covering. The tank of water, being partly over the well, is kept at nearly the temperature of the warm well in winter and cool well in summer. Whatever method is adopted to obtain a water supply, it should furnish pure, fresh water in the most convenient manner for house use, and the stock should have easy access to pure water as near the temperature of the bottom of the well as possible. It has been proven, by careful experiments, that it pays in dollars and cents to heat water with fuel for stock in winter. It should certainly pay much better to retain the natural heat of the water as it comes from the earth, and give it to the stock as nearly as possible at that temperature.

The Church Shed.—It is astonishing that so many people can go to church week after week, and apparently enjoy the services, when the horse that takes them to and from the church is tied to the fence, and exposed to the cold winds, snow, or rain. In summer the flies and hot sun annoy the horses. Too often the country church sheds are a disgrace to the cause of Christianity, and it would be a good thing if the pastor should talk very plainly to his flock regarding this matter. If the old adage, "poor as a church mouse," were changed to "poor as a church shed," it would be very appropriate in many cases. Be merciful to every creature.

WINTER SHELTER FOR LIVE STOCK.

CHARLES S. PLUMB, INDIANA EXPERIMENT STATION.

There are two good reasons why live stock should be sheltered in winter: First, because animals will suffer great discomfort if not protected from the winter's storms, and secondly because animals exposed to the severity of winter must be kept at a financial loss that would not occur if they were properly cared for. No man has a right to cause his dumb beasts needless suffering. The person who owns a comfortable stable is cruel if he forcibly drives his live stock into the open field, to wander aimlessly about during the day, and become exposed to icy blasts and storms. Yet many do this, as they consider it easier work than to care for the animals during the day in the stable. The writer has seen cattle roaming over fields of broken-down corn stubble, when the thermometer registered over ten degrees below zero, and the ground was white with snow. It was some such treatment as this that caused the freezing and sloughing off of the ears of a Shorthorn cow which I once purchased. Anybody who will expose a dumb beast to cause such suffering deserves to be prosecuted to the full extent of the law.

Can a person afford not to give his live stock suitable shelter during the winter months? During the winter of 1892-3 I had six milch cows, divided into two lots of three each. Lot one was kept in the barn, excepting for about an hour a day, when it was turned into a yard for water and exercise. If the weather was disagreeable, the cows were returned to the stable at once after drinking. The cows of lot two staid in the stable over night, but were turned into a yard and exposed to all kinds of weather from eight a. m. till four p. m. For seven weeks this experiment was continued, daily record being kept of the amount of food each animal ate, and of the pounds of milk each gave per day. Every few days each animal was weighed. At the end of the experiment it was found that the cows kept in the barn had given 161 pounds more of milk than the others, had eaten less grain food to produce this milk, and had gained in weight over two hundred pounds, while those that were exposed had lost in weight. These comparisons refer to the total results from each lot. As the sheltered cows showed a financial gain of about $12.00 in the aggregate over the others in increased milk flow, cost of keep and increase in weight, it certainly paid to shelter them.

At the Kansas agricultural college, Professor E. M. Shelton demonstrated the value of shelter in winter for pigs. Two lots of pigs were fed, one in a warm barn, and the others in an exposed yard. During the three weeks of greatest cold, the pigs in open yards required 17.15, 15.46 and 22.6 pounds of corn for each pound of increase, while in the warm barn during the same three weeks, 6.7, 7.32 and 4.72 pounds corn respectively were expended for one pound of increase. The general results of this experiment agree with previous ones of Professor Shelton. Professor J. W. Sanborn of the Utah experiment station has for some years investigated the influence of winter exposure on farm live stock. In his last published bulletin upon this subject, he gives experimental data with cattle, sheep and swine. He has found that cattle having limited exercise, kept in box stalls in a warm barn, gave a more economical growth than did those exposed in the open air. For the past two winters he has found that sheltered sheep made better use of their food than those in the open air. The general evidence of scientific investigation will substantiate the examples above given. In view of these facts, will it not be wise in owners of stock to more carefully protect their stock during the winter?

Stables should be well ventilated, and cattle and sheep given a reasonable degree of exercise on pleasant winter days, in a yard or field in a sheltered location. Constant confinement in stalls from day to day is injurious to the constitutonal vigor, but if an hour's exercise is allowed, it invigorates. If the air is cuttingly cold, the exposure should not be made. Dairy cows are thinner and more quickly affected by the cold than beef cattle. Fat hogs and cattle suffer less from cold than do thin ones, as they are in a measure protected by the fatty tissues covering the body. A dairy cow is naturally sensitive, and must accordingly be handled with reference to that constitutional quality. Circumstances alter cases, and set rules cannot always be applied, but certainly every one owning farm animals can and should make a reasonable effort to give them the proper winter protection for warm-blooded animals.

PURE-BRED STOCK IN AUSTRALIA.

GEORGE A. MARTIN.

The wealth of the principal British colonies of Australasia consists largely of its flocks and herds. The pastoral industry is a leading one in Australia, New Zealand and Tasmania, the sheep alone numbering something more than one hundred and twenty-two million head, of which a hundred million are in Australia. In New South Wales alone the total value of pastoral property, including land and improvements as well as stock, is estimated at something over eight hundred million dollars. All this, and much more, are the results of a comparatively few years of growth and development. Men who are still vigorous and hearty can well remember when the British possessions of Australasia were known chiefly as penal colonies, or the homes of savage cannibals. Now, populent and opulent cities, thriving towns and well appointed rural homes have largely replaced the savagery of a few years ago, as they do everywhere under the shadow of the British flag. When the British colonists carried civilization to those remote southern seas, they naturally took along domesticated animals of their own improved breeds. The herds and flocks thus established have been maintained with great care and frequent accessions of fresh blood from the mother country and elsewhere. In building up this great live stock interest many peculiar difficulties have been encountered. Terrible drafts have at times more than decimated the flocks and caused great suffering. The wild dogs and foxes are in places so numerous as to cause heavy losses to flockmasters. Worse than all the wild beasts have been the rabbits. In an unlucky hour a colonist introduced a few rabbits, and from them has sprung a great progeny covering large tracts of the country and devouring the herbage. The losses from this destruction fo pasturage have amounted to millions of dollars, and millions more have been expended in restricting the works of the individually feeble but collectively formidable pests. In the face of these obstacles—in fact, scarcely checked by them—

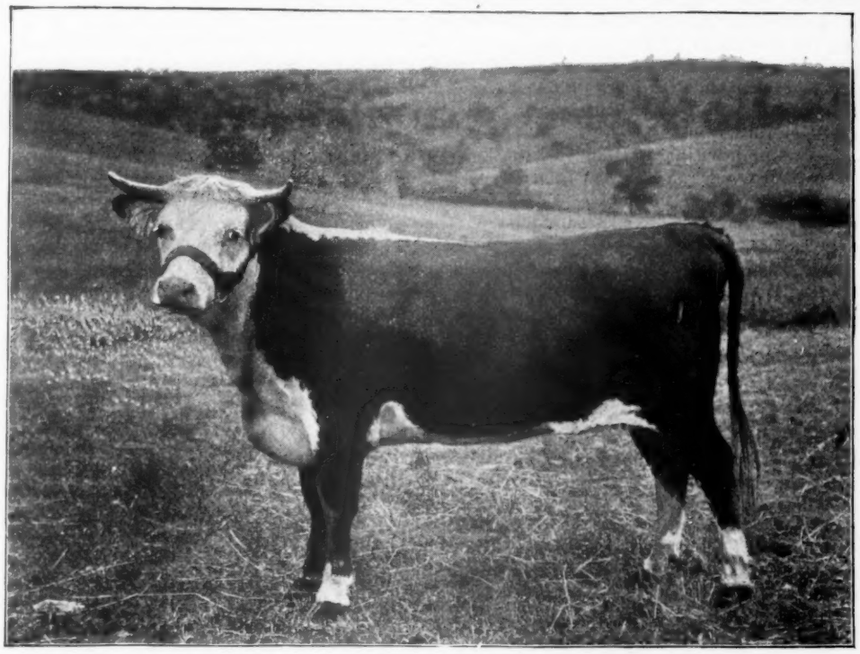


Fig. 1. AUSTRALIAN HEREFORD HEIFER, VENUS 2D.

the pastoral and live stock interests have continued to grow to their present magnitude, with prospect of still greater expansion. Great care and enterprise are shown in maintaining the purity of the respective breeds. Herd books and stud books are maintained with much skill and diligence. The great distance has hitherto prevented any considerable export of beef, either alive or slaughtered, from Australia to the British markets. But the prospective development of the trade in frozen meats has inspired the hope that this may furnish an outlet for the surplus of the Australian herds, and given a fresh impulse to the business of breeding and feeding for beef. As may be supposed, Shorthorns and Herefords are very popular breeds in Australia, and many examples of either breed can be found which could compete on equal terms with any in the world. The accompanying illustration, Fig. 1, engraved from a photograph, presents the Hereford heifer, Venus 2d, bred by Hon. J. H. Angas, Sire Sir Roger, dam Venus. Fig. 2 is a portrait of the famous Australian Hereford bull, Count Comely, also bred and owned by

Fig. 2. AUSTRALIAN HEREFORD BULL, COUNT COMELY.

the Hon. J. H. Angas, of Angaston, South Australia. Count Comely was calved in 1888, and is by the celebrated sire, Sir Roger, out of Comely 6th, by Carisbrook. His pedigree runs back on the paternal side to the great bull Tredegar, renowned in the history of English Herefords. Count Comely has an unbroken record of success in the show ring, having always taken first prize in his class wherever exhibited, besides which he has for two successive years taken the champion prize of all Australia. When awarded the champion prize in 1891, he had to compete with a Hereford bull which had taken the first prize of the Royal Agricultural Show at Windsor. He is, in fact, as will be seen by the accurate portrait, a model Hereford.

The Collingrove herd, headed by this great bull, was founded by Hon. J. H. Angas in 1869, the original stock being the bull May Duke 3965, and two Hereford cows, all imported from England. Additional importations have been made from time to time, and all but the best of the progeny weeded out and sent to the block. Mr. Angas is also a breeder of high class Shorthorn cattle, his herd of that breed having taken over three hundred prizes in competition with the Shorthorns of all the colonies.

THE COW BARN OF THE FUTURE.

JOHN GOULD, OHIO.

It is not difficult to see that there are to be radical changes in the near future in the plans of barns to be built or remodeled on the dairy farms of this country, and that we shall in the future build more in accordance with our wants, and the convenient care of our stock, and not erect costly structures which make much show but necessitate crowding the cattle to fit the barn rather than the reverse. The improved methods of dairying and the trend of circumstances that are making old ways wholly unprofitable, call to the dairyman to investigate and see if compliance with the new ways does not demand economy in the construction of the barn, in the saving of unnecessary cost, space and labor, rendering the cows more comfortable, with stalls planned to fit the cows, and at the same time comply with the requirements of cleanliness.

The rapidly increasing practice of winter dairying, and the success of the later systems of cold storage, the two equalizing the offerings of dairy produce upon the market, has made the dairyman a student in his profession. He sees that he must dairy it 365 days in the year, and that the barn must be in everyday use all the time. So the old 30x40 foot structure with its cramped and limited stables is wholly unsuited to his wants. The yet more modern stone-walled basement barn, surmounted with its castle-like structure, is an extreme as far the other way from desirable utility. A barn to meet modern requirements must be warm in winter and cool in summer, light, easily kept clean, one that dries out readily, in fact, a desirable living room the year round. Not one stone basement barn in ten answers the demand. Too little light, liability to be damp, bad ventilation, close and musty in the summer and redolent with smells in the winter when doors must be closed, are their objections. The advent of the silo, and its stores of food compressed into the smallest space, and of a character that calls for summer conditions of life, the small demand for hay for winter feeding, and the prospect now that the summer soiling ration will be corn put into a special silo the autumn before, makes the huge barn to hold the bulky crops of little use save to stand six months of the year a cavern of winds, bringing no profit, in fact a loss by depreciation of value and despair.

Then how shall we build? With the entire change in foods, there is no occasion to pitch the rations up hill, and then down again, so the low barn fills the requirements of the case. The demand for plenty of light makes it imperative that there shall be no blank walls in the stables, so the latter needs to be a distinct affair as far as it relates to anything that will obstruct the light. This light balloon frame, boarded inside and out, with lining of building paper, extending north and south, thirty-four feet wide inside and at least nine feet in the clear, and cased windows so that each cow shall have an average of three square feet of glass, seems to be the desirable stable of the future. The studding of this barn may be sixteen feet, which gives a large hay or straw loft, but the overhead floor should be of matched stuff so the hay shall not be fouled with the breath of the cattle and vapors of the stable.

The plank floor laid on "sleepers" has no place in the modern cow barn. Let the floor be made on the ground, first clay thoroughly pounded down, and then cemented or tiled. The new paving brick laid in Portland cement makes a fine floor. No floor should be tolerated that has space under it to become a cavern of foul things, solid or liquid. The stable fittings will not be the unspaced row, but half box stalls; at least six feet six inches, in which two cows will stand fastened with halters or some of the chain suspended stanchions. The old rigid stanchion is a relic of the past days, when cows were only tied up nights and were fed outdoors. It might have answered a purpose, but now when for seven months the cows are in the stables most of the time, and even the advocates of exercise admit that their cows are only out a "little while daily," the cows must have more freedom of movement than the old stanchion gave, hence the popularity of the halter and neck chain. This cow will be kept cleanly by a proper gutter behind her, with grating over it, not a gutter that will hold the accumulations of two weeks, but a small trench, which will be cleaned every day, and land plaster sprinkled, horse manure or some other absorbent as good placed in it, and the stable kept clean and devoid of smells. The ventilators of this stable will not open from the top of the room so as to allow all the warm air to escape, but will reach within a foot of the floor, and, reaching to the cupola above, carry off the foul air and gases that lie in the lower level.

The well-appointed stable will be provided with a watering device in the mangers, so that at the proper time the cows can be watered and each have her portion in peace, and if not wanted at one time, can be had at the time wanted. At one end of this stable will be a combined silo and hay barn, provided the loft is not large enough to contain the little hay that the dairy of the future will demand. This silo will be large enough to hold the feed wanted from fall to spring, and connected with it will be a small, deep silo to hold the feed put up in the fall to soil the cows from the time of drying feed until the regular soiling crops are in season. This barn with its windows will give the cows all the advantages of sunlight in the winter, the double walls and good doors will make it free from frost, the ventilators coming to the floor will keep the air pure without carrying off the warmth, screens and a shade at the windows will make it cool in the summer and free from flies. Best of all, such a barn with all the modern improvements, convenient in every respect, economical in every method, will only cost hundreds of dollars, where the castle-like structure with stone basement, and superior to it in no point of utility, costs its thousands.

PAYING FOR QUALITY IN MILK.

L. S. HARDIN.

A great amount of useful information in dairy science has been accumulated within the past dozen years, and no single fact has been better established and acknowledged by all dairy authorities than the uniform relative amount of casein and fat in milk. Milk which is rich in fat is rich in casein. The reverse of this is also true, milk poor in fat is poor in casein. This abandons forever the once prevalent idea of a "specific cheese cow." This has been proven and promulgated time and again by the experiment stations. It only needed the final and now world-renowned Columbian Dairy tests to practically prove it in an open air contest.

The Jersey having carried off the first honors in an open contest she is entitled to admission into the herds of patrons who supply milk to creameries and cheese factories. The lion that lies in her path is the prevailing method of paying for milk by the pound at the factories without regard to quality. The lack of beef qualities in the Jersey carcass is not so important a factor. It is a cruel injustice to the man who takes five per cent. milk to the factory to be forced to sell it for the same price as the man gets who brings milk testing only three per cent. of fat. This rule applies to both the creamery and the cheese factory. What, then, is the remedy? It is already in sight. The introduction of the Babcock fat test is the Jersey's salvation and the death knell of the skim-milk cow.

Already a fair proportion of the factories in the United States and Canada have introduced the system of paying for the milk according to the amount of butter fat contained in it. The managers of those factories have discovered that not only does the old method make an unfair distribution among the patrons, but if he purchases the milk himself he often loses money by buying water under the old system. Where no encouragement is given for richer milk he is sure to be getting continually more water, whether his patrons are honest or not. These same managers have always claimed that they had more or less dishonest patrons who watered the milk. The way to overcome dishonesty is to pay only for the fat in the milk. There is nothing like appealing to the pocket to make men take better care of their stock, and introduce better blood.

WINTER RATIONS FOR POULTRY.

R. W. DAVISON, NEW JERSEY.

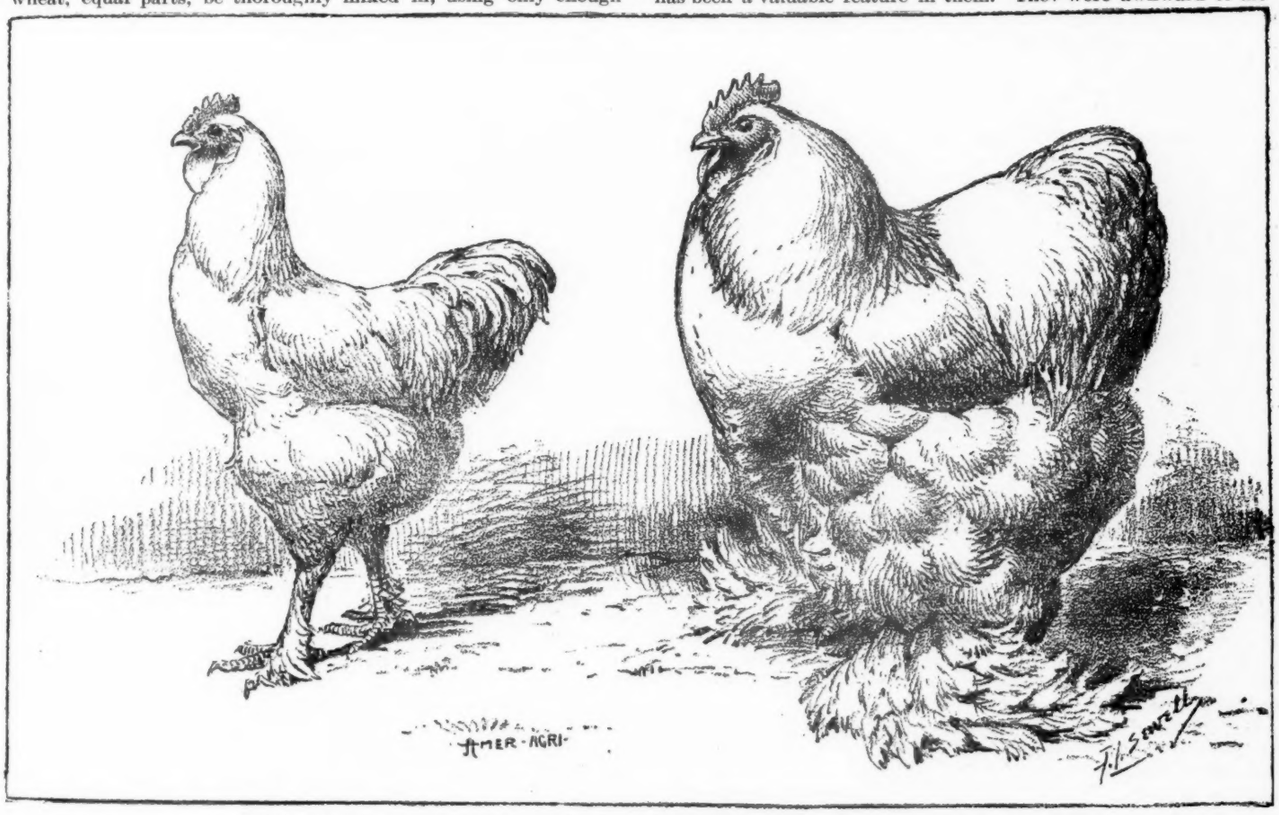
A bushel of wheat, judiciously fed to a good flock of hens, will yield far more than if sold in the market at seventy-five cents, or if fed to any other stock, and the same may be said with regard to corn, buckwheat, oats, or potatoes. Corn is injurious when fed exclusively to fowls. It is deficient in egg material, while it makes the birds so fat that they cannot lay eggs. No farmer would think of feeding a brood sow heavily on corn before pigging, or soon after either, and yet the same farmer will stuff his hens with corn twice a day and then grumble if they do not lay. Corn may be fed at night in cold weather, but it must be remembered that an egg is a complete food in itself, and that it requires a variety of substances to produce it. In summer the hens are enabled to find a good variety for themselves, but not so in winter.

An excellent morning feed is clover leaves and seeds, such as are found on the floor where hay is thrown down for the horses, mixed about one-half clover and one-half feed. This should be scalded well, and then bran or middlings and ground oats or buckwheat, equal parts, be thoroughly mixed in, using only enough water to make the mess stiff and crumbly. A little salt should be added and, if possible, some ground meat and bone, say one-eighth of the whole. Feed while warm, and only what the fowls will eat up quickly. On alternate mornings small potatoes, boiled and mashed, should be used in place of the clover. At eleven o'clock scatter wheat or any kind of small seeds in the litter on the floor, having the litter five or six inches deep. This will give the hens the necessary exercise. Feed the last meal about one hour before sundown, scattering it on the floor; this will give the fowls time to dig it out before dark. If the farmer would rather chop wood than trouble himself with fixing the warm morning mess, I would recommend that small grains such as wheat, oats, buckwheat and barley be used for breakfast, on alternate mornings and at eleven o'clock, with whole or sifted cracked corn in the litter at night. Cracked corn is better than whole corn, as it will give the fowls more exercise in getting it. In feeding, one thing must not be overlooked if success is to follow, and that is the danger of getting the fowls overfat by over-feeding. Over-fatness might be classed as a disease. The fowls should always be kept in fair condition, neither too fat or too poor. It is the well built, compact, active fowl to which we must look for eggs, while the over-fat, sluggish bird will not pay for her keep. When sorting out the winter stock, keep only those birds together that are nearly alike in activity and size. The small active Leghorn or cross should not be in the same house with the larger and more sluggish Brahma or its cross. Careful attention to the habits of the young fowls and their diet will be well repaid by their growth in flesh and the increase in eggs.

FROM RED SHANGHAI TO BUFF COCHIN.

FRANKLANE L. SEWELL.

Few fanciers now living remember the original Red Shanghai as it first came into this country. It was long before I began to sketch birds from life, so the accompanying illustration of the original Red Shanghai is a copy from an old description of the wonders of that day in the poultry yard. They were high steppers and high reachers, we are told, and the recommendation for their size was, that they could eat corn from a barrel, and what their appetite would not lead them to reach for a long way was very poor food. This vigorous appetite and powerful constitution, however, has been a valuable feature in them. They were awkward to the ridiculous extreme, long legs, lank necks, and a poor excuse for a tail, attached to an angular body. But they were big, so they met with favor, and the many years that have been spent upon them have brought them to a very grand fowl, of imposing appearance and rich color. In the show pen they are, perhaps, the most imposing of all domestic poultry, and out on a green lawn the complimentary green and orange buff give a touch of beauty to the estate that must attract admiring glances from every passer-by. The English fanciers have carried the abundant feathering which the birds have proven capable of producing to the greatest extreme, and there are specimens of strains from the best yards, with foot feathering nearly equaling in length those in the wing flights, being from six to eight inches. This, with great abundance of feather and fulness of fluff throughout the body, gives the bird a very grand and showy appearance. Several birds of this variety changed hands last season, at two hundred dollars each, most of them being purchased from England to compete at American shows. The illustration of the modern Buff Cochin, which is a descendant of the old Red Shanghai of nearly two score years ago, is from a sketch of a prize winner at one of last winter's exhibitions in New York city.



ORIGINAL RED SHANGHAI AND MODERN BUFF COCHIN.

AN INEXPENSIVE AND SATISFACTORY BROODER.

ARTHUR WARNER, NEW YORK.

The value of a brooder for rearing chicks, even when hatched in small numbers, and by hens, is being recognized more and more each year. The brooder illustrated herewith can be made at home with trifling expense. It does not differ from the ordinary box brooder in principle, and occupies only about one-tenth as much floor space. The materials to be purchased are: A pound each of No. 6 and of No. 8 nails, a low glass lamp, a piece of common sheet iron or galvanized iron two feet square, nine feet of tongued and grooved surfaced pine boards and about an equal quantity of surfaced or rough inch pine or hemlock boards not less than six inches in width. A shoe box or two may be taken to pieces and used. A piece of fine wire screen and a few strips of

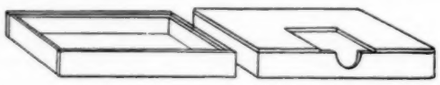


FIG. 1. WARM-BOX FRAME. FIG. 2. BOTTOM OF BOX.

heavy cloth should be provided. Make first a square frame of six-inch boards, the inside measure being a trifle over two feet. Then to the upper edge of the frame nail cleats one inch square inside the box, flush with the top (Fig. 1). These cleats should join at the ends, so as to make a tight rim all around. Now bore two half-inch holes through the cleats and boards six inches from the ends, on two opposite sides of the box. Turn this warm box over, lay the sheet iron in, and nail it to the cleats. The side of the frame which is now up is next to be covered with inch boards (Fig. 2), an opening eight by sixteen inches being left in this covering half way between the extremities on one side, and a notch cut in the side down to the sheet iron. Now make a small box (*a* Fig. 3) with a bottom, two sides and one end, using the shoe box material except for the bottom. This is eight inches wide and sixteen long. It is to be set in the eight-by-six inch opening, just far enough to fasten,

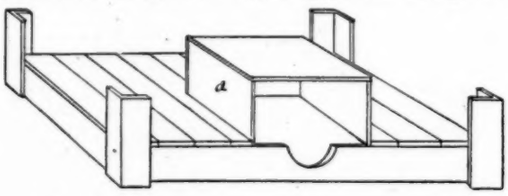


FIG. 3. WARM-BOX AND LAMP BOX UPSIDE DOWN.

forming a lamp box, the chimney passing through the notch, with its top one inch below the sheet iron. Legs made of three to four inch boards, put together at the right angles, are now nailed at each corner. They extend upward one and one-half inches further than the bottom of the lamp box (Fig. 3). Bore several inch holes in the sides of the lamp box near the bottom. Next make a floor for the brooder three feet square of matched boards (Fig. 4). Find the exact center of this floor, and six inches from this in one direction cut a two-inch-square hole, *b*, and another similarly in the opposite direction. Reverse the floor from the position shown, lay it down and place the lower or warm box part of the brooder (Fig. 3) upside down upon it, and nail the two together in such a manner that the floor will project beyond the brooder warm box six inches on every side (Fig. 5). Be sure that the cleats which hold the floor

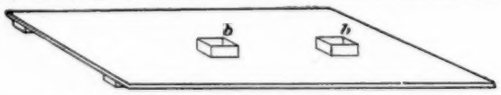


FIG. 4. FLOOR OF BROODER WITH REGISTERS.

boards together do not interfere with pulling out the lamp. Three pieces of sheet iron are placed at the sides and back of the lamp box, to protect the wood from the heat.

The lamp board (*c* Fig. 5) is made of two boards, placed at right angles and braced. The upright board should be tight enough to close tightly the front of the lamp box, and of sufficient height to cover the notch. Bore two or three finger holes in this board. The bottom board is seven inches wide and fifteen long. The lamp may be held in place near the end of this board by cleats, or be set into a hole cut for this purpose. The two registers, *b*, which admit hot air under the hover are two inches square inside measure, and one and one-half inches high. Tack a piece of wire netting over each. Odd pieces may be used in making the sides and the board for the chicks to run up and down upon (Fig. 6). The latter is eighteen inches in width, with small cleats nailed crosswise three inches apart. The hover (Fig 7) is two feet square. Bore an inch hole in each corner, and insert pieces of broomstick eight inches long for

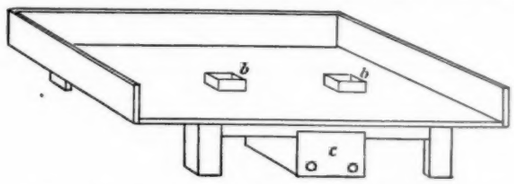


FIG. 5. APPEARANCE OF BROODER WITHOUT THE HOVER.

legs. Bore a series of holes one inch apart in each, beginning three inches from the lower end. The hover is held up by means of nails inserted in the holes, and may be fastened at any desired height. Strips of cloth four inches wide are tacked on and slashed every one and one-half inches. It will be seen that the sheet iron is an inch below the floor of the brooder. No gas from the lamp enters where the chicks are. A gentle heat is furnished, which induces

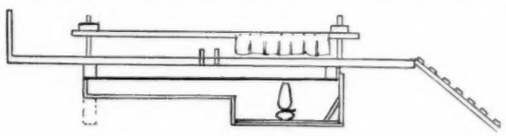


FIG. 6. SECTION OF COMPLETE BROODER.

the young birds to sit down instead of crowding and reaching to get their backs against the hover over them, and sufficient heat enters at the registers to prevent them from crowding together.

FERTILE EGGS IN WINTER.

Much can be done to secure fertile eggs during the winter season. To secure such eggs, one must try to obtain as good an imitation of natural conditions as possible. A warm, roomy house, covered with dry earth and sand, in which the fowls can scratch, a sunny window near which the fowls can bask, a variety of grain, supplemented by a little meat and a generous supply of vegetables, such as cabbage, onions, turnips, boiled potatoes, and the like, the raking in of the grain into the earth or a litter of leaves, to induce exercise, these are necessary to secure the highest degree of fertility at this season.

Great care should be exercised in gathering the eggs for hatching. They should not be left for the evening collection, but should be gathered several times a day, at ten o'clock in the forenoon, at noon, in the middle of the afternoon, and at night. An egg will stand considerable cold without freezing. Sometimes an egg seems

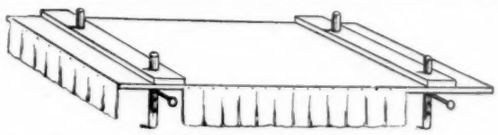


FIG. 7. BROODER HOVER WITH SOME FLAPS REMOVED.

to retain its power of hatching after being subjected to considerable exposure, while at other times a slight exposure to cold seems to ruin its chance of hatching. To be on the safe side, therefore, one should gather the eggs frequently, and take as few risks as possible.

Water should be kept before the fowls at all hours in the daytime. If warmed enough to take off the chill, it is all the better, and will be less liable to freeze. The fowls should not be compelled to drink ice-water at any time. As soon as the water begins to freeze the vessels should be emptied, or a small amount of hot water added to that in them. But, if the house be warm, there are few days in the year when the water will freeze. At night, of course, the vessels should be emptied of their contents.

To secure fertile winter eggs, the fowls should be in vigorous health. By correct feeding, by the securing of plenty of exercise, and by strict attention to cleanliness, health will be promoted. It may sometimes be necessary to use condiments and condition powders. Some of the latter are really excellent in themselves, when they can be procured in proportion to their value. Always try to secure good health by proper attention to food and sanitary conditions.

RAISING FIGS FROM SEED.

W. F. MASSEY, NORTH CAROLINA EXPERIMENT STATION.

Few persons are aware how easy it is to grow figs from the seed. Seeds from freshly imported layer figs germinate almost as readily as cabbage seed, and soon make fine bushes. In the spring of 1892 I washed out a lot of seed from the finest figs I could find, and sowed them in pots in a greenhouse, putting them into ten-inch pots as soon as large enough, and when the weather was settled, transplanted them to the nursery rows. They grew last season to the height of about two feet. January, 1893, was a period of unprecedented cold, and all of our old fig trees were badly cut down, but, much to my surprise, the young seedlings were not injured near so badly as the old bearing trees. I did not expect any fruit on these seedlings under four or five years, and I was therefore surprised to find that one tree out of a lot of over one hundred had, in its second year's growth, set fruit. This small tree bore several figs. The general opinion has been that the true Smyrna fig will not mature fruit without "caprification," that is, unless set by the pollen-carrying insect, common on the wild Capri fig. These seedlings have been grown partly to test this, and we will observe our precocious fruiting plant with great interest another season.

We have at our station between thirty and forty varieties of figs and have tried in vain to get the true Smyrna fig. We have had figs under that name, but they usually turn out to be the Angelique. We are, therefore, in hopes that some of our seedlings may reproduce the true variety. But there is evidently a great diversity among them so far as foliage is concerned, the leaves varying from broad ones, very slightly lobed, to some with leaves cut up into long, narrow segments. Some make an exceedingly robust, stout wood, while others make compact, short-pointed shoots and a moderate growth, so that now the plants in our fig nursery run from three feet to over five feet in height. We have them now branched from the ground, and as a matter of perfect security have bent the limbs to the ground this winter, pegged them fast and laid green pine boughs over them. These will do no harm even if the winter proves no colder than our average ones, and will carry them through even if we have a repetition of last winter. We note, too, a great diversity in the recuperative powers of the old varieties. Most of our fruiting trees were killed to the ground last winter. All of them grew very rankly last summer, but many failed to fruit, while others were loaded with fine and perfect specimens. The following bore good crops of late fruit: Osborn's Prolific, Early Violet, Negro Largo, White Marseilles, Brunswick, Brown Turkey, Celestial and Pegustrata. White Genoa shows a few figs, as also do several other sorts. The most tender of all and the most hurt by the severe winter are San Pedro and the White Adriatic. We may not have a winter to do as much damage again in ten years, but it is safer, I find, to branch the trees from the ground and lay them down in winter. A cover of pine boughs is quickly laid, and does no harm in any event. I find the little Chinese or Celestial fig the hardiest of any tested here, and it is the only one which had ripe fruit nearly all summer. In sheltered spots in some town gardens the Brown Turkey saved wood enough to give a fair crop of ripe fruit by middle of August. In other places trees with stems the size of a man's leg were killed to the ground. [The leading varieties of hardy fig are illustrated in the above engravings, reproduced from original photographs of figs grown on the grounds of the North Carolina Experiment Station. Fig. 1 shows the White Marseilles, Fig. 2 White Genoa, Fig. 3 Black Provence, Fig. 4 Osborn's Prolific, Fig. 5 San Pedro, and Fig. 6 Negro Largo.]

FIG. 1. WHITE MARSEILLES FIG.

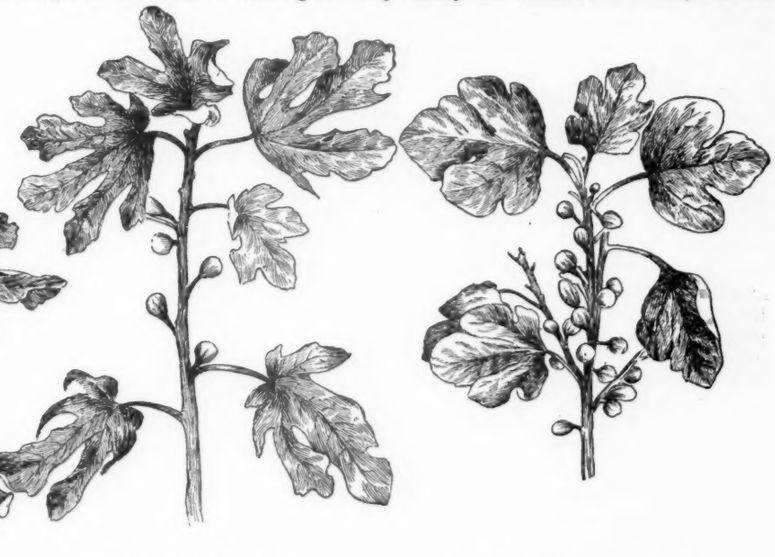


FIG. 2. WHITE GENOA.

FIG. 3. BLACK PROVENCE.

FIG. 4. OSBORN'S PROLIFIC FIG.

FIG. 5. SAN PEDRO.

FIG. 6. NEGRO LARGO.

STOMACH WORMS IN LAMBS.

GEORGE W. FRANKLIN, IOWA.

During last autumn there was great complaint of mortality among lambs in all parts of the United States, and this was not exceptional, for it is so nearly every year. The lambs are taken from their dams suddenly, and placed apart in some inclosed lot, and in a few days of bleating for their dams they begin to retrograde; parasites increase in numbers as the lamb deteriorates and fails to obtain the nutrition necessary to keep up thrifty growth. If malnutrition sets in, the lambs soon lose their appetite, diarrhea ensues, they become emaciated, their breathing is difficult, and a swelling is noticed about the throat and lower jaw. If not relieved, death results. When lambs have become so affected, some owners apply lotions, liniments and salves to the swellings ,and lance them with a sharp knife. Such treatment is erroneous, since the trouble lies deeper. The swelling is an indication of malnutrition, which is induced by the presence of countless thousands of thread-like worms in the stomach. We are led to ask why the swelling on the jaws when the trouble is in the stomach? Dropsical effusions are general symptoms attending many forms of disease where imperfect nutrition is present. It is the presence of great numbers of the twisted stomach worm (*Strongylus contortus*) in the stomach of the lambs, which interferes with the digestive functions. As the lamb is robbed of its proper nutrition, dropsical swellings result as outward indications of the trouble.

Long before the swelling occurs in the throat of the lambs, they will show signs of languor, which indicate that they are not well. This is the time when treatment should begin, before the swelling appears under the jaws and diarrhea and loss of appetite have emaciated the lamb. The affected lambs should be separated from the remainder of the flock, and given twice daily a dose of one-half ounce turpentine in one to two ounces of raw linseed oil. This will not only remove the stomach worms, but also any intestinal or lung worms which may be lurking in the system. This species of the strongylus is not found in great numbers in adult sheep, but in lambs its numbers are in direct ratio with the unthrifty condition of the lamb.

The practiced eye of the shepherd can see when the first symptom of irregularity comes in the lamb, and he is at once prompted to use proper treatment for preventing any further disturbance in the functions of its system. In the incipiency of any disorder is the time to begin treatment, for a very sick sheep or lamb is difficult to treat with medicine, and one may as well kill it at once.

The lung worm (*Strongylus filaria*) is sometimes troublesome, but this species is indicated by somewhat different symptoms. The lamb coughs a great deal, and a mucus runs from the mouth and dries upon the under lips, though the lamb will always have a good appetite. The disease caused by this parasite is known as the "paper skin," owing to the bloodless condition of the skin. The treatment recommended above will prove beneficial in this disease, and will reach the worms through the blood.

PRIVATE FISH PONDS.

L. D. SNOOK.

To those who have never had any practical experience in fish culture, the idea of preserving a private fish pond is full of fascination. The ability to step out at any time and catch a mess of fish for family use, or to please the palate of visitors, is a theme that interests nearly every landowner in sections where running streams prevail, or where dams can be easily constructed. Unless one is familiar with the details of the work, it will be best to study carefully the construction of artificial ponds. Making the pond usually requires but little engineering skill, as water seeks its level and will only run down hill, but one must plan to get rid of the overflow without allowing the fish to escape. If the pond is to be simply an excavation in an open field, provisions must be made for a supply of water during severe drouths, and in cold climates the pond should be made deep enough that it will not freeze solid to the bottom in severe winters. When all these points are attended to, there is still the important matter of the kind of fish with which to stock the pond, as most kinds of fish to thrive need their freedom, and fish that grow and multiply in a running stream, or in a large body of water would often perish if put in a pond of even an acre or two in extent. Shade of some kind must be provided, and food must be furnished either artificially or natural. The uncertainty is so great that the actual expense of the construction of fish ponds and the food provided for the fish, will often bring the price of fish actually caught to one dollar per pound. Undoubtedly more than half of the artificial fish ponds are total failures, or have not a marketable fish in them to-day. A few years ago the German carp was heralded as the coming food fish, but has failed to meet expectations, and when produced even under favorable conditions is inferior in flavor to the majority of American food fishes.

OATS FOR HORSES.

Experience has proven that as a grain food for horses few feeds are equal or superior to oats. Many farmers and teamsters, however, by experimenting, have decided upon a combination of feeds that, in their judgment, makes a ration superior to anything else obtainable. Some use a mixture of ground corn and wheat bran. Others feed the corn soaked with a sprinkling of chopped stuff, while others get more value from cut hay dampened and sprinkled with ground feed. For those who are satisfied with a standard food and one that careless teamsters and stable men will not be liable to injure horses with by overfeeding, oats will prove more satisfactory. When American corn is worth less than a cent a pound, and oats sell for over a cent and a quarter per pound, the feeding value is no doubt in favor of corn, but corn being very heating, great care must needs be exercised in dealing it out. In fact, some horses are made sick by a few rations of maize. Constant feeding for two or three months deranges the system, requiring a complete change of diet, and often necessitates the calling in of a veterinary surgeon. The thick hull covering the oat kernel prevents fast eating, consequently more saliva is formed, which aids digestion, yet some horses eat so voraciously that many of the kernels are swallowed whole. When this fact is discovered, either have the grain ground and fed dry or place several stones two inches in diameter in the feed box. These will prevent the grabbing of a full mouthful of grain at once, and thus cause twice the time to be spent in eating a given quantity.

PROFITS IN HOME MARKETS.

No manufacturer can sell a half-finished product at a profit. The man who puts on the finishing touches before it goes to market, is the one who gets paid for his work. Remember this if you are feeding cattle. It is, of course, more trouble, and requires more time to market your products to private customers than to sell to dealers, but can you not get pretty well paid for it? See what the additional prices will pay you per day. That is the way to figure it.

There are very few farmers who have not some product that could be sold direct to the consumer. Look over your farm and see what you have in that line. In the winter your time may not be in such demand but that you could drive to town every day with butter, eggs, milk, lard, potatoes, or any of the dozen things of which you have some surplus. There is nothing that town people so like to buy direct from farmers as good hog products. Country lard and country sausage are in much demand as soon as cold weather sets in, and you can make it pay to butcher more than one pig at home, if you will use some effort to find customers for the product.

Not the least advantage that comes from selling direct to the consumer is that it gives you the cash in hand. This seems to go further than the same amount of money placed to your credit at the country store, and you also have more money for the same produce.

EVERY-DAY FARM PHILOSOPHY.

The more you love yourself the less you are sure to love others.

A trifling dog is generally not half as trifling as the man who keeps him.

Some fellows kick a horse every time they enter his stall, and then wonder why he does not love them.

The stalk of corn that grows the tallest and appears the most conspicuous, nearly always bears a blasted ear.

Prodigality is no sign of generosity. It rather indicates a narrowness of both mind and heart too contracted to comprehend the real value of things.

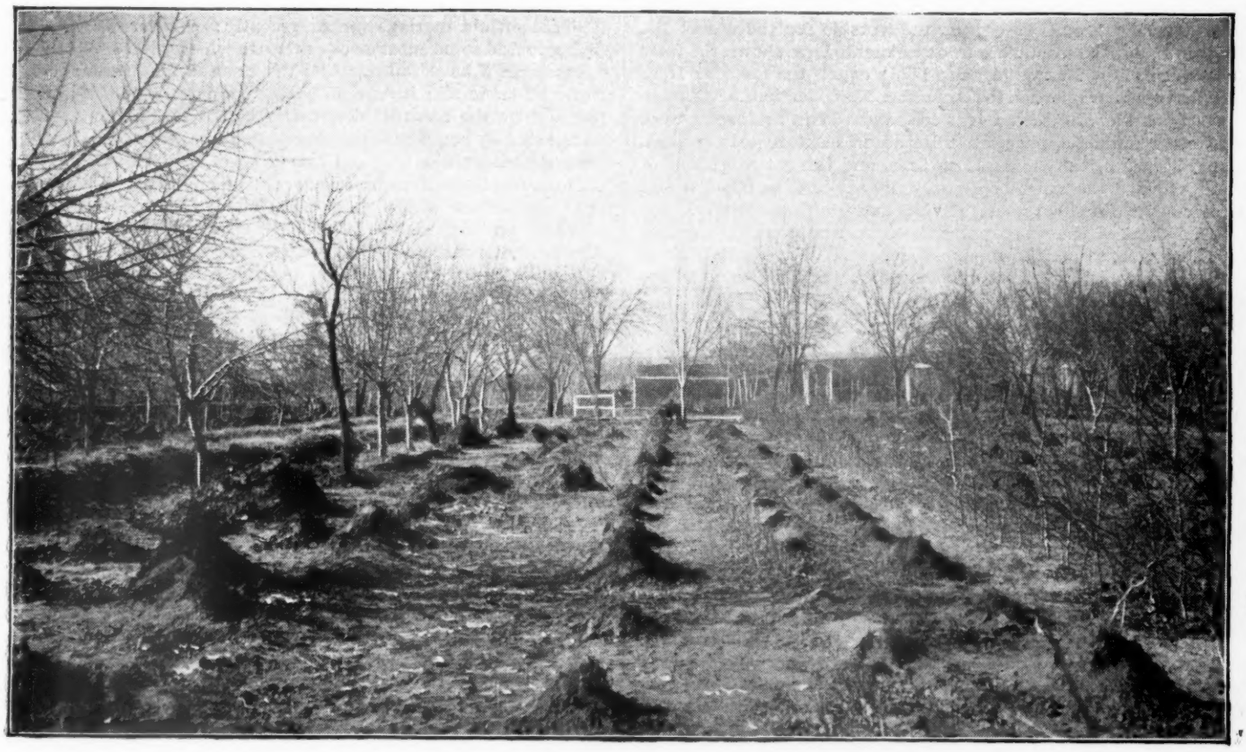
If some men would hoe with as much devotion as they appear to pray in prayer meeting, they would not have nearly so much complaint of hard times to make.

The man who will spend the most time, in the harvest season, talking politics, is generally the one who is of the least account to either himself, his neighbors or the government.

FRUIT-GROWING IN NEW MEXICO.

N. A. P. GENTRY, NEW MEXICO.

It is now an established fact that the cultivation of fruit in the valleys of New Mexico is a marked success and a paying industry of growing importance. Large additions are annually made to the acreage. The quantity of production has proven entirely satisfactory. The quality is excellent. No display in the most favored localities could eclipse that made at the recent Territorial fair. The illustration, from a photograph, shows a combination of orchard, vineyard and pleasure garden, also irrigation ditches. The small mounds seen are simply soil piled around the Mission grape vines, to protect them during the winter. The earth to form the mounds is dug from the soil immediately surrounding each plant. This is dug down early in the spring, and as a consequence the stools receive late fall and early spring sub-irrigation and deep tillage. The mounds serve another important purpose. The roots are protected or guarded against premature growth, and are thus held back until the variable days of early spring are past. The Mission grape grows equally well on trellis work or in single stools, if well pruned. The latter method is almost always adopted as the least expensive in practice, and the most easy of protection and most convenient in harvesting. All kinds of fruit, not tropical, seem to find their natural element in the Rio Grande Valley. Grapes give a paying crop the second year, and apples, pears and peaches often yield from three to five pounds the first year.



WINTER VIEW OF A NEW MEXICAN FRUIT GARDEN.

TRANSPLANTING MAPLE TREES.

In sections where the hard maple thrives, it makes the most valuable, durable and ornamental shade tree that can be obtained, and usually it can be had from the adjacent woods for the asking and digging. In warmer climates the soft maple is much planted. As the foliage of both starts early, they should be transplanted as soon as the ground is free from frost, choosing trees not over two and a half inches in diameter at two feet above the ground. Leave on all the roots possible, keeping them well protected from the sun and wind until again set out. The best success is usually obtained by cutting off all the branches, and sawing off the top eight or ten feet from the ground, covering all side wounds with paint, or varnish, and tying over the top a cloth saturated with liquid grafting wax. Branches will be thrown out on all sides, and, should any of them appear too low, remove them, letting all those above a certain height remain. If too thick, the natural growth of the strongest will crowd out the weaker ones. To obtain fully-developed shade trees, do not plant them closer than thirty feet.

THE CURL OF THE PEACH.

L. R. TAFT, MICHIGAN EXPERIMENT STATION.

The peach crop is oftentimes nearly destroyed by what is commonly known as "leaf-curl." This disease seems to be no respecter of localities, and the character of the soil has but little effect, except that it is less prevalent upon high and dry soils than on those that are wet and cold. The true leaf-curl is caused by a parasitic fungus which attacks the interior tissues of the leaves. As a result, they become thickened and puffed out, and frequently take on a decidedly curled appearance. In severe cases the leaves have a whitish look, the color being due to the multitude of minute white spores that are developed by the fungus. The leaves thus affected generally drop from the trees, and if the conditions are favorable to the growth of the fungus, all except a tuft of leaves at the tips of the branches may fall. In the nursery and in young orchards the effect is often quite severe, as the trees may receive such a check that, if they survive, it is not outgrown for some time. In the bearing orchard the loss of a considerable portion of the foliage will cause much of the fruit to drop. This may be due directly to the check that the tree has received, or to the fact that all of the energies of the trees are being exerted in developing new leaves.

Not only is a soil that is cold and wet likely to induce the disease, but if there is a period of cold, rainy weather soon after growth starts, the trees seldom escape. From the fact that in seasons when the weather in the month of May is warm and pleasant there is little if any curl, it is evident that the check given to the trees by the adverse conditions in soil and air, which prevented the roots and leaves from performing their normal functions, has much to do in inducing the disease. It is well known that some varieties are much more subject to the disease than others, and in a general way it can be said that such kinds as have thick, fleshy leaves, with an open texture, are more injured than varieties with thin, papery foliage. A curled appearance similar to that caused by the fungus is often due to the presence of plant lice, aphides, upon the leaves. They puncture and suck the sap from the foliage, and the irritation thus produced causes a thickening and curling of

the foliage that is often mistaken by the careless observer for the real curl-leaf, although they are seldom very injurious, and as a rule they do not appear until midsummer.

Observations and experiments would seem to indicate that something can be done to ward off the disease by planting varieties that are least subject to attack upon high, light and well-drained soil, and that if the trees are properly headed in, thoroughly cultivated, and supplied with a liberal amount of plant food, in the form of ground bone and wood ashes, or potash salts, they are either able to ward off the disease, or to withstand the attack, much better than if cared for in a slipshod way. Although there were some vague suggestions as to the possible value of some of the fungicides as remedies for this disease, nothing was really known until the past season. Several enterprising fruit growers gladly coöperated with this experiment station in an attempt to conclusively test their efficiency, and we have been able to demonstrate, to our own satisfaction and that of observers in at least half a dozen counties in Michigan, that the peach growers have in the Bordeaux mixture a remedy that is reasonably sure. It has been supposed and so stated—by the writer among others—that the application of any fungicide would be of doubtful utility, as the conditions that are most favorable to the development of the disease, *i. e.*, continuous rainy weather, would be equally unfavorable for the use of the fungicides, but the results of our experiments have shown the facts to be otherwise. Everything else being equal, the freedom from curl has been in proportion to the number of applications. Although the early part of the season was cold and wet in most sections of the State, a simple application of Bordeaux mixture (three pounds copper sulphate, three pounds of lime, and thirty-two gallons of water) reduced the amount of curl fully one-half, and had a still greater beneficial effect upon the vigor and health of the trees.

The value of the remedy was shown to a more marked degree even than this, as at the sub-experiment station at South Haven, Mich., almost complete immunity was secured, while some of the neighboring orchards were much injured. In this case three applications were made, and during the early part of June it was difficult to find a diseased leaf upon any of the trees that were sprayed, while it was even more difficult to find a healthy leaf upon unsprayed trees. The effect, moreover, was lasting, as to the end of the season the foliage was free from disease and of a better color than upon unsprayed trees; in addition, a far more satisfactory growth was obtained, and the fruit was large and free from the attacks of other fungi and of insects. In fact, not only has Bordeaux mixture been found to be the safest and most effectual form in which to apply copper sulphate as a fungicide, but it is also an excellent medium in which to suspend Paris green for application against the curculio. Used alone in water, the foliage of the peach is badly injured by the soluble arsenious acid, and it is not a safe remedy; but combined with Bordeaux mixture it can be used without danger of injuring the foliage, at the rate of one pound of Paris green to three hundred gallons of the mixture. We shall then have a remedy against the rot, mildew and other fungus diseases; for the curl and for all leaf-eating insects it will be equally valuable.

To be most effectual, the Bordeaux mixture should be applied just before the leaf buds open. If preferred, a solution of iron sulphate (copperas), at the rate of one pound to twenty gallons, may be used instead for the first application, and repeated about the time the last blossoms have fallen. A third spraying at the end of ten days or two weeks will be desirable, and if the season is a wet one a fourth application will generally be a good investment. In making the Bordeaux mixture, care should be taken to use fresh lime and to have it properly slaked. Unless boiling water is used, it should be added only as fast as it is taken up by the lime. When carefully prepared and used as directed, with the addition of Paris green, it offers us a cheap and effectual remedy against the curl-leaf and the other diseases and insects enumerated above.

CARE OF WAGONS AND CARRIAGES.

HOLLISTER SAGE, CONNECTICUT.

The life of the carriage depends not alone upon the character of the work and material put into its construction, nor does its lasting beauty depend upon the paint and varnish used, although this has much to do with it. The man who owns the vehicle must do his part toward properly caring for and preserving it. There should be no chance for gases from stable or manure heap getting into the carriage room, for ammonia in the air will destroy varnish and fade colors, both of painting and upholstering. Ammonia unites with and gradually destroys the oil in the varnish, shrinking it, making it brittle, and leaving it full of cracks. For the same reason, the carriage house should be dry and well ventilated. A frame building is better for storing carriages than one made of stone or brick. The carriage room should be moderately lighted. Too strong light or total darkness injure the colors of paint and trimmings. Even dust has a deleterious effect upon carriage varnish, and nice vehicles should be covered with sheets made for the purpose, but these must not be thick enough to keep out the light. Close muslin is the best. An aid to the preservation of varnish, as well as to the appearance of all rolling stock, is frequent washing with cold water. While a carriage is being washed it should be kept out of the sun. Abundance of water should be used with which to float off the dirt. Never use the sponge with a rubbing motion, as this scratches the varnish. Squeeze the full sponge against the panels, allowing the flow of water to carry off dust and dirt harmlessly. Following the washing of each portion of the gear and body, wipe it with a chamois skin, care being taken to rinse the well-soaked skin in water frequently, so that it may contain no particles of dust to scratch the varnish. Hot water and soap should not be used. It is best to wash carriages always at once on the return from a muddy drive, and before they dry.

Said an old carriage maker, recently: "After many years of trying to find some substance or mixture which will benefit the tops to carriages, I have failed. And the same is true throughout the world of trade and invention." From the moment the leather is placed upon the bows its destruction begins, and although it may be retarded by occasional washing with pure, soft water, it will, in time, shrink more or less, and lose its early comeliness. Never put oil, and, emphatically, never use varnish upon it. An occasional light application of the finest olive oil was, at one time, recommended, but experience has only condemned the use of this, together with every other substance. Top carriages should never remain long with the top down, and when they are left standing, the joints should be broken slightly, to take off the strain on leather and lining. Aprons and curtains should be frequently brought out and aired, or they will soon spoil. To prevent or destroy moths in woolen linings, fumigate thoroughly with turpentine or camphor.

The new vehicle should always be washed in cold water soon after its arrival, and the same treatment should be given carriages recently varnished. This holds true even if the varnish is somewhat tender, although it must be dry. Dust acts with peculiar force on fresh varnish. Frequent washings and exposure to fresh air will harden the varnish and increase its luster.

Every vehicle, whether new or old, should be inspected frequently, that no bolt, clip, or tire may get loose. The smallest repairs that become necessary should be made at once, as nothing injures any kind of a machine so much as play of parts which were made to remain solid. The axles should be well cared for. Commonly they are neglected. They should not only be oiled frequently, with the best of castor oil, using but a very small quantity, but, previous to each oiling, they should be carefully wiped with cloth, or sponged off with warm water and soap. Never use a compound that will gum on the axle, and take pains not to scatter dust from the tire upon the naked axle when removing the wheel.

No labor about the farm pays so well as the frequent painting of the rims, or oiling them with boiled oil. No part of the wagon is so much subject to destruction as the rims, which roll between stones and through hot sand, grit, and deep mud. Rims that are kept thoroughly painted demand less tire setting, and less frequent renewal. It pays to keep all wagons well painted, whether for work or pleasure. Heavy vehicles may be quite as well protected by paint applied at home as more expensively in the factory. And it is not difficult to procure ready-mixed preparations that are reliable. It is surprising to note how much benefit a good application of boiled linseed oil, given occasionally, will do. Wagons from which the paint has entirely worn, and which the owner does not care to rub, sandpaper and carefully paint, he may sponge over with this oil, thoroughly colored with lamp black, or coach black, and the transformation will be as wonderful as it is cheap and sudden. No wagon should ever stand, even for one hour, exposed to sun and wind, outside of the owner's barn. And the careful user will seek protection from the elements whenever he stops for an hour. The durability of the vehicle may be doubled by careful usage.

Salt for Horses.—Place a box of salt near the watering trough so the horses can lick it whenever they go to drink. This is preferable to the usual method of salting the farm horses once a week.

NEW STRAWBERRIES.

A strawberry combining early maturity, fair size and good eating qualities, has long been sought. To judge from the many favorable reports received from experienced fruit growers, such a variety is found in the Rio, recently introduced by the Cleveland Nursery Co., Rio Vista, Va., and illustrated in Fig. 1. It is a seedling of the Sharpless, and originated with M. T. Thompson, of Ohio. It is described as an extra early berry, bright red and beautiful; of medium to large size and growth; firm; quality excellent, flowers perfect; foliage strong and healthy; stalks rather large, bright green, becoming dark; plants highly productive. In Fig. 2 is shown a berry of the Tennessee Prolific, which is recommended for a second early variety. This is a seedling of Sharpless and Crescent, showing the parentage of both. It is described as large, handsome, as productive as Haverland, and superior in every way, except that it may not be any firmer. It ripens very evenly; the blossoms are perfect; the foliage is healthy and beautiful. Wherever tried it has given satisfaction. Both varieties are certainly worth a trial by amateurs as well as professional fruit-growers.

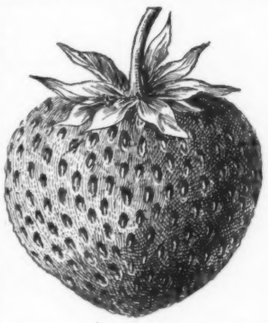


FIG. 1. RIO STRAWBERRY.

MOISTURE IN BEE CELLARS.

W. Z. HUTCHINSON, MICHIGAN.

When first put into the cellar bees seem to be able to bear two or three months of confinement with almost any kind of treatment, but late in the winter there is sometimes trouble from moisture. If they can then be warmed and furnished a dry atmosphere they will recover. To understand how an excessively damp atmosphere in a cellar can work injury to bees, it must be known that they are constantly consuming honey, with no opportunity to void their fæces, and that a large share of the waste matter, particularly the watery portion, is thrown off by respiration and perspiration. Should the air of the cellar be of the same temperature as the inside of the cluster of bees, and at the same time be saturated with moisture, it would not take up or absorb the exhalations from the bees, and the result would be that the sewage of their systems would be dammed up, their intestines would become overloaded with fecal matter and water, and the result would be diarrhœa. I would not be understood as saying that a dry atmosphere will always prevent bee diarrhœa, as the food may sometimes be so unsuitable for a winter diet that diarrhœa could not possibly be prevented without frequent flights; neither does a damp atmosphere always cause diarrhœa, because the food may be of such excellent quality as to prevent it, even with other undesirable conditions. But moisture is one of the factors that helps to bring about this diseased condition, and it is one of the unfavorable conditions that can be removed, while some of the others are beyond removal, or, at least, very difficult to prevent. Bees that were suffering from diarrhœa in a damp cellar have been removed to an upper room especially prepared for them, and the warm, dry air from a coal stove allowed to pass up through the room until the bees were dried out, their swollen bodies becoming reduced in size, and they could then stand a month or more of confinement in the cellar if necessary.

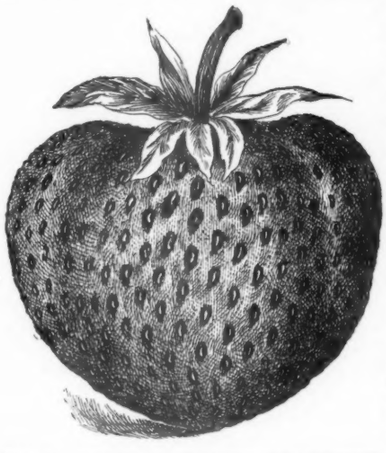
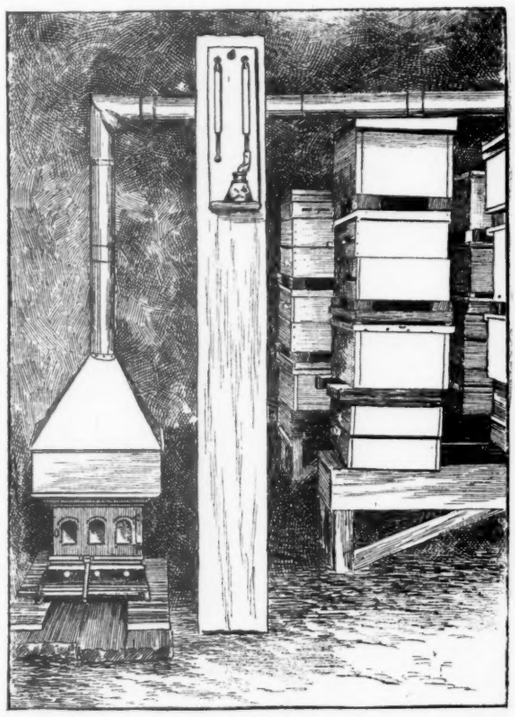


FIG. 2. TENNESSEE PROLIFIC STRAWBERRY.

Cold air contains but little moisture. At 32° Fahrenheit a cubic foot of air holds only a little over two and one-third grains of moisture. At 50° it will receive nearly four and one-fourth grains. At 70° it will absorb nearly eight grains before becoming saturated. At 100° it has the power to absorb over nineteen grains of water. What is needed in a bee cellar is an atmosphere that will readily absorb the moisture thrown off by the bees. Many attempts have been made to approximate the most desirable temperature for a bee repository, but it will be readily seen why there has been so much confliction of views. There have been almost no attempts to determine the moisture, or the degree of saturation, as well as the degree of heat, and one is fully as important as the other, each having an action on the other. If the temperature of the bee cellar is 40° F., and then the temperature be raised 10°, the absorbing power of the air is increased about one-fourth. If the temperature remain the same, and some method of drying the air be introduced, its power of absorption is increased just the same as though the temperature had been raised. What is needed is an atmosphere in which the percentage of saturation is low, and this may be secured at almost any temperature that is likely to be found in a bee cellar, and probably the easiest way to secure this is by heating the air. The percentage of saturation may be ascertained by means of a wet and dry bulb thermometer, or hygrometer as it is called. Such an instrument can be purchased, but it is so easily constructed that it



PROPERLY ARRANGED BEE CELLAR.

is not worth while to buy one. Attach two thermometers side by side to a piece of board. What are called dairy thermometers are most convenient, as there is no framework of tin around them to be in the way when covering the bulb of one of them with candle wicking or muslin. To the bottom of the board nail a crosspiece perhaps two inches in width, thus forming a small shelf upon which may be set a tin cup, or a wide-mouthed bottle for holding water. Make a light covering of wicking, or cheese cloth for one of the bulbs, allowing the wicking to extend down into the water in the cup, or bottle. The water will ascend the wick and keep the bulb constantly wet. There will, of course, be evaporation from the wick surrounding the bulb.

Evaporation causes a loss of heat; hence, the drier the air the greater the evaporation, the greater the loss of heat, and the lower will go the mercury in the wet bulb thermometer. The greater the difference of temperature as shown by the wet and dry-bulb thermometers, the drier the air. When the air is saturated there is no evaporation from the wick, and the mercury stands exactly the same in each instrument. When it is raining the outside air is always saturated, and a hygrometer placed in the open air will show the mercury at the same point in both thermometers. As soon as the air begins to dry, the mercury in the wet-bulb instrument will begin to sink, because evaporation is taking place from the wick and lowering the temperature. In my sitting room,

heated by a coal stove, the mercury in the wet bulb will register about 60°, while that of the dry bulb shows perhaps 75°. This shows only 36.7° of saturation. In my cellar, with the wet bulb at 40° there is seldom a greater difference than 4° between the two instruments. This shows a saturation of 67.7 per cent. This difference cannot be maintained without an occasional resort to artificial heat. If the cellar is left to itself the difference is only about two degrees. By the use of artificial heat and placing unslaked lime in the cellar to absorb the moisture I have forced the mercury in the wet-bulb thermometer five degrees lower than it was in the dry bulb. With the wet bulb at 40° a difference of three degrees will answer, provided the colonies are strong and in good hives.

This brings up two additional points, viz., the strength of colonies and the protection they have. The normal temperature inside a cluster of bees in winter is 65°. If the colony is large and the hive well protected this temperature is easily kept up, but weak colonies in open hives suffer in the same temperature that would be comfortable for a strong colony. The warmth of a strong colony in a good hive is the same in effect as is a fire to us in our room on a damp day. It raises the temperature and increases the absorbing power of the air. There is not much to be gained in furnishing the cellar with warm, dry air, unless the hives are so arranged that there is plenty of communication between the inside and outside of them. To accomplish this there is no better method than that of raising the hives two inches from the bottom boards. This can be done by stacking the hives up in tiers, with a two-inch block under each corner of each hive. This not only allows abundant ventilation for carrying off the moisture from the bees, but it also allows the dead bees and debris to drop away from the combs, keeping the latter sweet and clean. In stacking up the hives, the weaker colonies should be placed at the top, as that is the warmest place in the cellar. The outside air in winter is usually colder and also drier, having a lower percentage of saturation than that in the cellar. An excellent way of bringing in the outside air is through a sub-earth pipe of glazed tile with the joints cemented. The ordinary tile with open joints allows the air to absorb moisture from the earth as it becomes warmed in its passage. The glazed tile and cemented joints prevent this, and the air enters the cellar warmed to the temperature of the earth, and its percentage of saturation is very low.

Another method is to warm the air, if it needs it, by means of artificial heat. If a constant heat is needed, a small coal stove is good. If only occasionally heat is needed, a kerosene oil stove will answer, but some kind of an arrangement is needed to carry off the gases of combustion. For this there is no better way than to have a hood of tin made to hang over the top of the stove, with a tin pipe passing from the top of the hood up through the floor and connecting with a stovepipe in the room above, which will also ventilate the cellar. Of course an oil stove and a hygrometer can be put into a cellar any time, even if the bees are already there. [The illustration on the preceding page is engraved from a flash-light photograph of one corner of Mr. Hutchinson's bee cellar showing a stove arranged in the manner described. It also shows how the beehives are stacked to give plenty of ventilation, and the wet and dry-bulb thermometers can be seen hanging against the post.]

FARMING IN HUNGARY.

F. C. CHAPPELL.

A large proportion of the population of Hungary is engaged in agricultural pursuits. Roughly speaking, farm hands in that country may be classified into the following divisions: Hired laborers, tobacco laborers, "zsellers," or what were formerly the serfs, day-laborers, and, lastly, contract laborers. Although the group is divided thus into five ranks, yet there is practically little difference between them. Even the peasant proprietors who are comparatively wealthy, or in fairly comfortable circumstances, send out their children as day laborers, while the smaller peasant proprietors assist in all the processes of the maize cutting and harvesting in return for a share of the produce. The "zsellers" are the survivors of the old serf system, which was abolished forty-six years ago. In return for their services these laborers receive cottages and a small plot of land, and, as an equivalent, they are bound to furnish the proprietor with a certain number of days' work in the year. The tobacco industry is a State monopoly in Hungary, and the laborers occupy rather a peculiar position. They form regular colonies on the properties of the large tobacco cultivators. They also make contracts with the owners of these properties whereby the laborer receives from one and one-fourth to two and one-half acres of land, a dwelling house and the necessary forage for one or two horses, together with half of the price of the tobacco which the laborer has grown. In compensation for these benefits he has to undertake all the work connected with the tobacco culture, and to superintend its transport to the place whence it is forwarded. This class of laborers seem to be very prosperous.

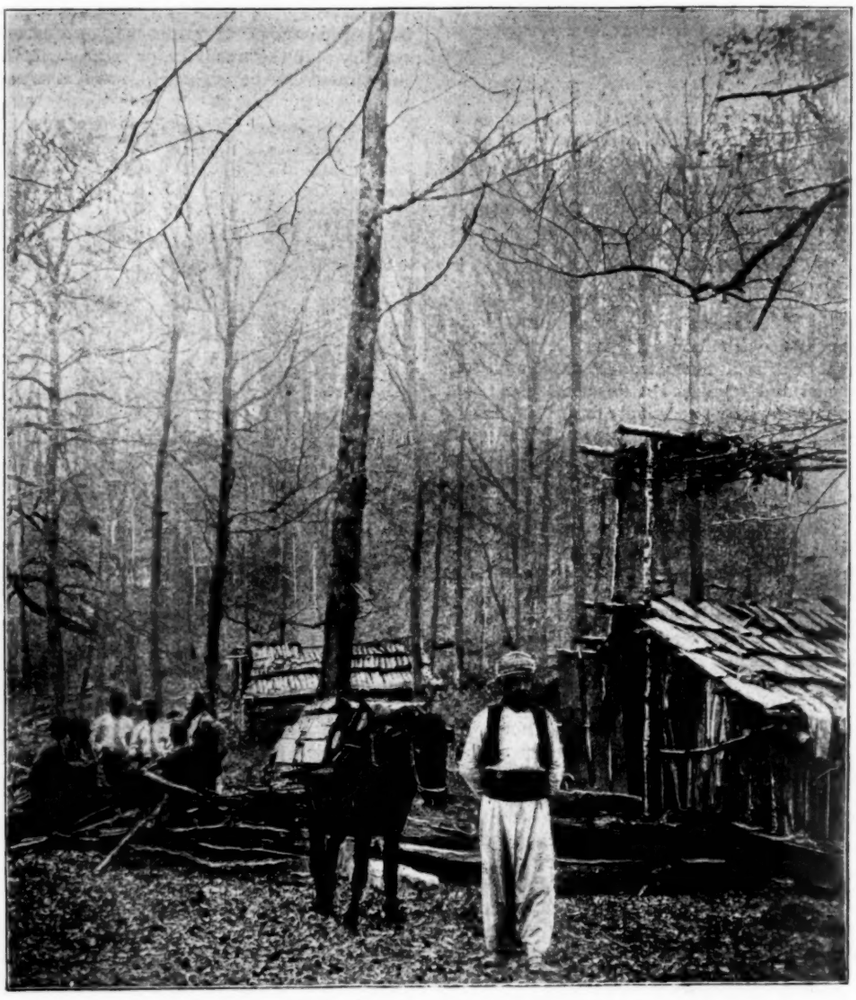


Fig. 1. HUNGARIAN PEASANTS CUTTING STAVES.

As regards general agriculture the men in the Alföld district—which is a fertile plain, particularly adapted to an extensive system of farming—enjoy the next best position. The average day's wage during the harvest and hay making seasons is sixty-four cents for men, while in other parts of the country the highest daily wage does not exceed thirty-two to thirty-six cents. In the Alföld district

the population is very scattered and the farmers on the large estates have to solicit help during busy times, and this, no doubt, accounts for the relatively high rate of wages. While the harvest is being gathered in it is customary, in many places, to pay the wages partly in kind, and very often entirely so, and in such instances one-eleventh or one-twelfth of the harvest is given. With maize one-third to one-fourth is given, if the laborer undertakes the cutting, crushing and transport. In hay cutting one-half or one-third is distributed, and one-half of the second crop. The laborers hired by the day are generally provided with cottages. In the case of contract laborers, the agreement is usually for one year. These contracts are drawn up before a magistrate and concluded with the chiefs of the respective groups of laborers. Of course wages vary, according to local circumstances, but the contract men generally receive about the same pay as the hired hands, viz.: an annual wage of from $10 to $25 in money, and the following "in kind"—twenty-four metric centners (a metric centner equals two hundred pounds) of rye, six metric centners of wheat, and a similar quantity of barley. They also have free lodgings, fuel, and occasionally clothing.

For agricultural purposes Hungary may be divided into four parts. The most fertile is the Alföld district, to which reference has already been made; the second is that portion extending from the Danube to the Theiss. It is unsuitable for farm purposes, being mountainous and deeply wooded. In the middle of the third district—which runs from the western bank of the river Danube to the Austrian frontiers—is situated the great Bakonya forest and the Platten lake. The fourth section, called Transylvania, is hilly, wooded, and cold and damp; mining is the chief industry. In Upper Hungary the climate is too cold and too damp for successful corn cultivation, potatoes being the chief product. Although the climatic conditions are so unfavorable, the district is thickly populated, the natives of this part being called "Slovaks." The farms are generally quite small affairs. These people emigrate in large numbers to the United States, but generally return after a few years' absence. In Upper Hungary, and also in Transylvania, the cultivation of the land is conducted on very primitive lines, and if the people can satisfy their immediate wants, they seem to care for little beyond that.

Austria-Hungary has many dense forests, particularly in the districts of Bosnia and Herzegovina, half of which (that is, 6,620,934 acres) are forest. A good deal of this is, however, only brush-wood. Many of the forests, which early in this century contained splendid specimens of oak, ash, elm and lime trees, have fallen beneath the woodman's axe, but in the mountainous parts there are still extensive forests of good timber untouched, comprising oak, fir and beech in the northern district, and beech in the south and south-west. The oak found in the mountainous parts of Bosnia is the *Quercus robur*, and experts say that only in certain marshy places are found specimens of *Quercus pedunculata*, which is of thicker and larger growth than *Quercus robur*, which is of slow growth in Bosnia. Trees 250 years old do not measure more than eighteen inches in diameter, while they rarely attain a diameter of twenty-five inches, and those that do already begin to decay. Authorities on this subject claim that the wood is softer and less durable than the oak wood of Slavonia, but this disadvantage is counterbalanced by its being more elastic and easy to work. In Slavonia trees grow to fifty-one inches in diameter. The State allows the peasants to cut wood and make charcoal for their own use from the forests free of cost, and they also have the right of pasturage therein for their cattle. If, however, they cut wood and make charcoal from the State forests, they must pay a tax. The woodmen employed by the large companies work in gangs of eight or ten, and are paid so much per thousand for staves thirty-six inches long, four inches to six inches broad and one inch thick. A good workman will cut about 10,000 staves in a season, and is paid from $8.30 to $9.20 per thousand. [The accompanying illustrations, engraved from photographs, show in Fig. 1, on the opposite page, the cutting of staves, and in Fig. 2 a Hungarian forest scene.]

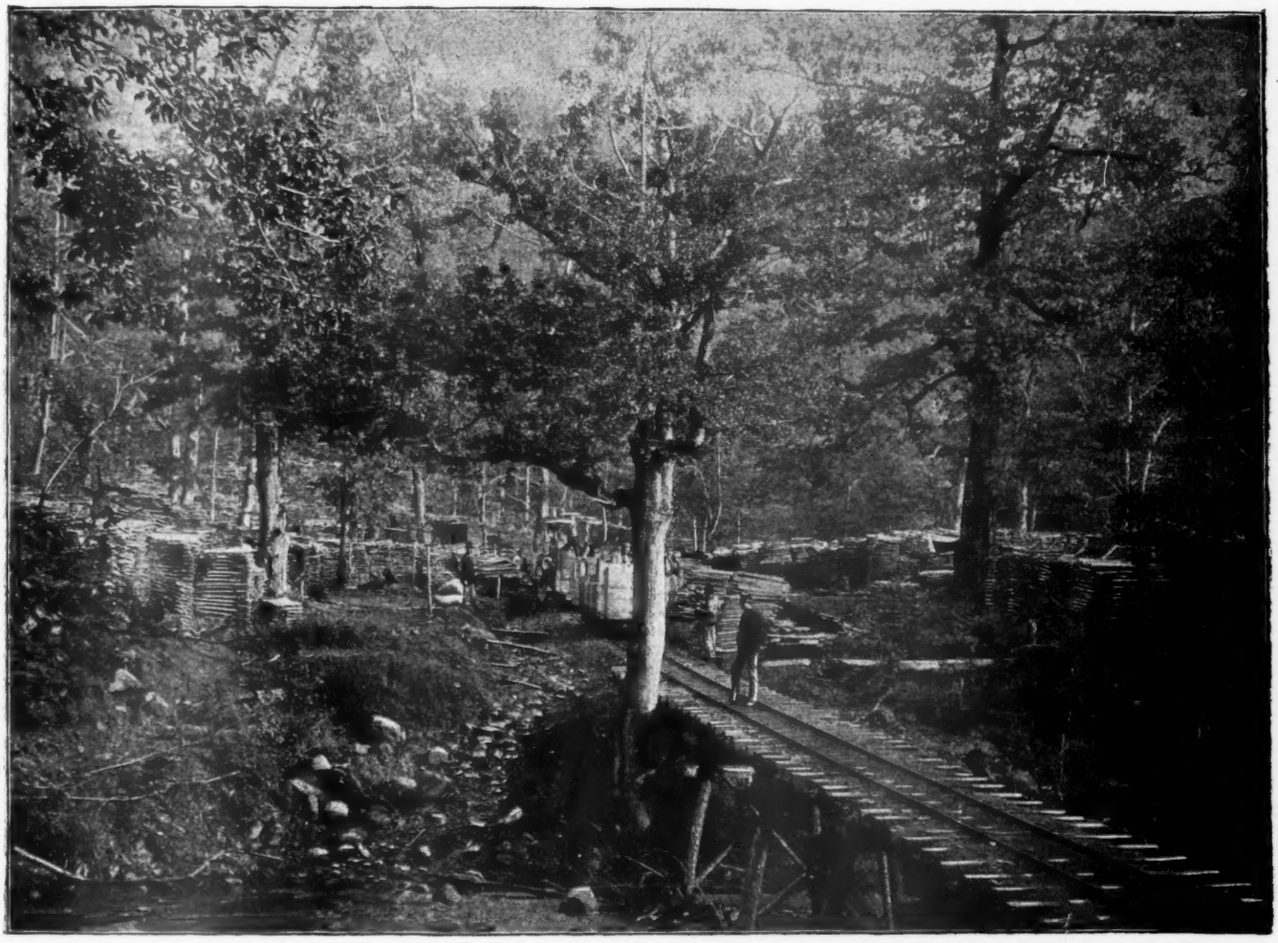


Fig. 2. FOREST SCENE IN HUNGARY.

ECONOMY IN BEEF MAKING.

J. R. DODGE.

The tendency to lower prices of agricultural products reduces the margin of profit, requires the avoidance of wastes which have been so general, and demands economy of labor and of methods. This statement applies to meat making even more than to the production of cereals, fruits and vegetables. The mysteries of animal physiology complicate calculations of cost of conversion of grass and grain into flesh and fat. It is evident that the beef maker should not merely be a man of sense and industry, but should be also one of intelligence and practical science.

Formerly, our cattle were scrubs, and our practice unmethodical, irregular, and the results, slow fattening, small yield of profitable meat, and poor intrinsic quality. The introduction of Shorthorns, and afterwards Herefords, Aberdeen-Angus, and other heavy breeds, gave larger carcasses and a greater per cent. of meat to live weight. Instead of four hundred to six hundred weight for poor natives, or six hundred to eight hundred for those better grown and fattened, we have now medium beeves of ten hundred to twelve hundred, and well-bred and continuously fed grades at twelve hundred to sixteen hundred pounds each, live weight. In the progress of this development there has been great waste and loss from unequal care and nutriment in summer and winter, in drouths and in seasons of bush pasturage. In fine pastures three hundred pounds may have been taken on in summer, while in winter, at the straw stack, no gain was made, or, if better cared for, perhaps fifty or a hundred pounds. Grown in this way the beef is gristly, tough, with tenderer layers interspersed with lumps of fat instead of being "marbled," the fat almost imperceptibly intermingled with the juicy flesh, as it would be with equal and continuous nutritive feeding. It required four years or more to get cattle ready for the butcher; they were not then of sufficient size, the net beef was not in good proportion to live weight, and the quality was poor. The yield of dressed carcass rarely exceeded fifty per cent. of the live weight, when it should have been fifty-seven. In fat stock shows individual animals when slaughtered often come up to sixty-five or more at the present time.

These suggestions of salient points in our progress in beef making recall the enormous wastes of the past from carelessness or ignorance, and hint at the means of securing a profit with narrower margins than formerly. The successful farmers of the present day find it necessary to reduce to two and a half or three years, or at most three and a half, the age of beeves, and of course to allow no cessation of flesh accumulation, and as little difference as possible in the rate of increase summer or winter. The difference between corn-fed and grass-fed beef is not so great as the range of condition on grass alone, as between semi-starvation on deficient pasturage, and blue grass meadows of Central Illinois or Kentucky. There is comparatively little beef now made with corn alone; it is mostly the product of grass, fresh or dried. Corn is, in this country, a necessity for pork, but scarcely for beef.

The advance in beef making is well illustrated from our exports. Thirty years ago we sent thousands of cattle to the West Indies from Texas and Florida at prices ranging usually between $13 and $17 each. They were Long Horn, of Spanish descent. Then we sent no beeves to Europe. Later the trade commenced, and in 1892 reached a great volume, 394,607 animals, valued at $35,099,095, or $88.95 per head, including a small contingent of Texas cattle sent southward. During the present year exports have fallen off somewhat, but the average value is $90.67. These animals are mostly high grade Shorthorns, with Herefords and other heavy breeds, and weigh from twelve hundred to sixteen hundred pounds. They are the result of the improvement from English breeds, without which this European trade could not exist, or our own markets be half as well supplied. This quality, which is represented in our export beef, is superior to the average beef slaughtered in England, and is preferred there by the most fastidious buyers. Other beef products, fresh, or salted, or canned, sent abroad in the fiscal year 1892, amounted to 398,000,000 pounds in round numbers, and was valued at over $34,000,000. Altogether, about $70,000,000 was the contribution of foreigners to our beef industry. It required for this aggregate exportation more than a million animals, as the average weight of the dead meat exports was very much less than that of the live beeves. Thirty years ago, with half our present population to supply, there was almost nothing exported. Now liberal rations for 33,000,000 increase of population leave a surplus ample for 20,000,000 foreigners, though they should consume thirty-five pounds per head per annum. This illustrates our magnificent progress in beef making during the past quarter of a century.

There is yet much poor beef in the markets, and great room still for improvement. What is worse, the mass of the people are so little discriminating as to quality that they allow themselves to be imposed on by retail dealers, paying nearly as much, usually quite as much, for beef bought at $6 per hundred, as for that purchased at $8. A glance at the Chicago cattle market shows that on the first of November "fair to medium" beeves were quoted at from $2.75 to $3.50, and "choice to extra shipping steers" commanded $4.25 to $4.50, but in the retail markets there was little difference in the prices at which it was sold. There is evidently greater opportunity for the exercise of science and skill in feeding and care, and a better chance for profit in this direction than in breeding. Apparently results of skilful breeding are now more widespread and general than the knowledge of the most profitable and efficient methods of beef making among the cattle farmers.

LESSONS FROM MY FLOWER GARDEN.

G. A. WOOLSON, VERMONT.

The fine display of poppies in my flower garden was the result of late fall sowing. The beds were renovated in October, and after being well settled by rains, and frozen, the seed was sprinkled on the surface. A time in the day was chosen for this work when the sun had thawed the surface a trifle, and the ground was sticky in consequence. All of these beds were labeled when made, which was of service in the spring, as breaks by heavy footprints will occur during the winter, which must be reseeded. All sorts and sizes of poppies bloomed for me. The season opened May 1st with the dainty yellow Iceland poppy, biennials in their second year, and closed with great double scarlet balls, rank in color and perfume, chiefly valued as showing the capabilities of their kind. A bed of English poppies was particularly fine in color and of good form. Nothing, however, can be more exquisite than the Shirley poppies with their wonderful filmy robes imported direct from fairyland. To be of much service as cut flowers, poppies must be cut before sunrise and placed in tepid water. By the second week in July age and aphis rendered most of them past their prime, and they were all pulled up. The beds were made over and asters substituted.

These plants were well along, having been transplanted once or twice since they were taken from the hotbed; consequently the garden was soon in full flower again. Too much cannot be said in praise of the best modern strains of asters; they are perfect in form and as varied in color as modern art could desire. The new branching white aster is worthy of note. Double the ordinary space was allowed the plants, which was quite insufficient, for many of the plants measured twenty-seven inches from tip to tip of the spreading branches. Not all of the flowers were perfectly double, but more "amenable to treatment" from an artistic point of view for having a yellow center. However, the general run of blossoms was large and double, and loosely imbricated like a chrysanthemum; so close was the resemblance that just before the hard freeze of October 18th a number of the plants were potted and placed in a large window, where they disported themselves for weeks before the admiring gaze of the public. Indeed, so sweetly did they impose themselves on "chrysanthemum worshipers" as the genuine article, that few were loth to forgive the fraud.

Truth compels me to say that the most attractive bed in my garden was of yellow zinnias, a flower which had hitherto held a prominent place in my floral "expurgatory index," banished thereto for their stiffness, angularity and destitution of soul; qualities not compensated for by colors, which, although individually good, are often so inharmonious with each other that a bouquet of mixed zinnias is usually a discordant affair. Out of deference to the donor, seeds of dwarf yellow zinnias were planted in the hotbed. In May the seedlings were transplanted into the bed grudgingly assigned them. The plants were strong and did not wilt under a blazing sun, which was fortunate, as they had the privilege of taking care of themselves—a duty they well performed. Blossoms appeared in June; at first so nondescript were the shades of yellow intermingled with brick-red, that all would have been pulled up had a substitute been at hand. However, as the season advanced, judgment was suspended. Evidently age improves some other things besides wine. The foliage was remarkably clear in color, and so luxuriant that not a stiff stem was visible; flowers bloomed in profusion, growing fuller and richer in tone each day. In short, the bed blazed with pompons, ranging in color from yellow to

orange, through tints of red to bronze, as correct in their graduation of color as rich plush fabrics, which they much resemble. Other annuals came and went; neighboring beds were twice replanted, but the zinnias for four months were in constant bloom and showed no trace of shabbiness until cut down by a hard freeze. Despite prejudice, for an all-around serviceable mass of color, nothing excels them. Ignorance often ascribed their glory to marigolds, albeit "honor to whom honor is due," and we doff our hats to the modern zinnia—the flower that perfects the art of growing old gracefully.

AN ATTRACTIVE COTTAGE COSTING $1,500.

Those who build cheap cottages generally expect as much convenience of arrangement and accessibility as those who build more pretentiously. In order to secure these, something must be sacrificed, generally something in the size and the quality of materials used. In the neat little cottage shown in the accompanying perspective view and floor plans, designed by E. A. Payne, Carthage, Ill., we have a good solution of the common question, in the newer portion of our country, of the maximum of house and accommodation for the minimum of money. The house, if well situated, will prove very effective and satisfactory. The rooms are of good size and easy communication, that between the parlor and dining room being through sliding doors. The dining room connects with the kitchen through the pantry. The parlor is provided with a Jackson heat-saving and ventilating grate. The four rooms below are trimmed in cypress, finished natural. All other interior woodwork is painted. The first floor bedroom—a requisite with almost every house in the West—is conveniently located, is of fair size and provided with a dressing room. The bath room is furnished with tub, bowl and closet. The back stairs rise from a small lobby, through which is also the rear exit from the bedroom. The stairs to the cellar lead down from the pantry. The pantry is well fitted with pastry table, shelves and bins. In the present instance a cellar is provided only under the kitchen wing, though if this is insufficient, or if one be desirous of heating by furnace, the space under the whole house could be excavated at little extra cost. On the second floor we have three chambers of good size, with a large finished attic suitable for a room for hired help. The construction of the house is good, as shown by the following abstract of the specifications: Dimensions thirty-three and one-half by fifty feet. Heights of ceilings: Cellar seven feet; first story ten feet; second story eight feet. The cellar is excavated to a depth of four feet, and the loose earth used to grade around the house at completion, leaving two feet of the foundation exposed to view on the outside. The foundation is of good rubble stone eighteen inches thick, laid in lime mortar and neatly pointed where exposed to view. The chimneys are of hard burned brick and mortar laid with close joints, and thimbles where required. The interior side walls and ceilings of the two stories are hard finished on two coats of best brown mortar and seasoned lath. The frame is of sound pine timbers, properly framed, raised and secured. Studding joists and rafters are spaced sixteen inches from centers, joist well bridged. All windows have box frames with seven-eighths stiles and timber sills of clear pine. The sashes are one and a half inches thick, glazed and hung to balance weights with best cord. The outside of the upright frame is first sheathed over with shiplap sheathing covered with rosin sized paper, and weather-boarded with half-inch pine siding and shingles, as shown in the perspective view. The siding boards show four-fifths of their width to the weather. The porches are constructed of clear white pine, with ceilings of narrow yellow pine and six-inch columns. The roofs are of cypress shingles laid four and one-half inches to the weather on number two fencing sheathing. The ridges are saddled with pine boards. The porch floor is of four-inch clear tongued and grooved pine; inside floors of one by six-inch tongued and grooved pine, all thoroughly nailed to each bearing. The outside floors are laid in paint. All door jambs are rabbeted plank, with three-inch grounds and five and one-half inch casings, with base and head blocks. Panels are formed under the windows in each story of the house, and the base in all parts matches the trim. The closets are shelved and hooked in the usual manner. The doors are paneled and molded, the outside doors being one and three-fourths inches thick; inside one and three-eighths. The hardware is of good quality throughout. The front door is provided with night latch and keys. Sash fasts to all windows. All outside woodwork usually painted has three coats of best hand mixed paint. Several houses have been erected after these plans and specifications, at costs varying according to locality, from $1,400 to $1,700 complete. In building a house, it is well, after planning the size as large as the means at disposal will allow, to consider the advisability of making some of the rooms a trifle smaller by cutting off a few inches here and there to enlarge a pantry or closet. One should always plan to save steps in the arrangement of table, dish pantry and sink, with reference to the dining room. The traveling over of ten extra feet for twenty times each day, in carrying dishes and food, aggregates twenty-eight miles of extra walking during the year, much of which may be saved by slight changes in the house plan. In painting, the main object should be to protect and preserve the materials used in the building, as well as to make an artistic appearance. The roof is one of the most important parts of a house, the maintenance of which may be the costliest item of repairs unless the roof is covered with the best material. Clear and well-seasoned cedar shingles or good slate are cheapest.

FIG. 1. PERSPECTIVE VIEW OF RURAL COTTAGE.

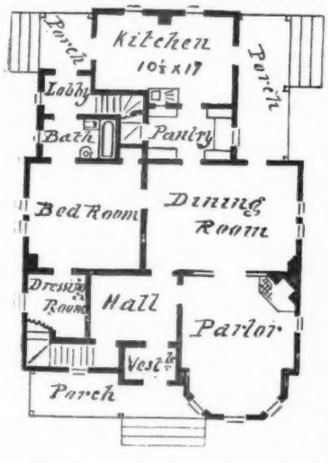


FIG. 2. PLAN OF FIRST FLOOR.

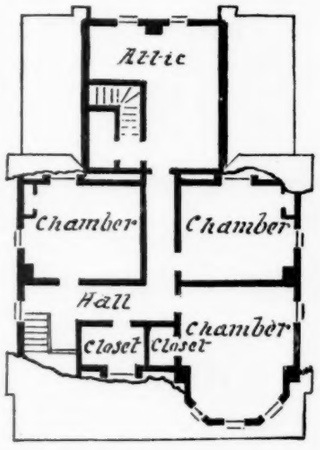


FIG. 3. PLAN OF SECOND FLOOR.

HOUSEHOLD

A Word to Parents.

VIOLETTE HALL.

Unhappiness is one of the privileges of old age. Joy is everywhere demanded of youth. The dividing line between content and discontent is exacting. It is drawn at knickerbockers and short gowns. Not until trousers and petticoats reach the ground are we allowed to realize how miserable we are. Although why the boy with a sore throat who has a home-coming looming up before him, after he has lost the money entrusted to him to pay a bill, and has also managed to tear his best coat, should be more wildly blissful than his father, it would be hard to say. Charles Dudley Warner protests that "one of the best things in the world to be is a boy." He probably knows. Though we are sure he must be thinking only of the whistling, ball-playing, big appetite, lusty lung side of boyhood. There is much brain fag in school, stomach ache in the nursery, and punishment in the attic, for every boy, no matter how fortunate his lot. However optimistically reminiscent the eyes that are turned upon young blood, there are none to discover that girlhood is "one of the best things in the world." Perhaps this is because the feminine mind has always taken life too seriously. The small mother who is brooding over the dislodged eye of her waxen baby is no less concerned than the larger mother who mourns the measles of her flesh and blood infant. "A pine bucket full is just as full as a hogshead," to quote Gail Hamilton. For the reason that little women are natural care-takers, they should be kept this side of anxiety as long as possible. One tiny maiden, in an original narration, says: "Then the mamma had eight children, all the same as twins you know—and they were very good and never had many clothes in the wash." Alas! that the weight of the family tubs should rest ever so lightly upon shoulders so small. Our illusions must all be scrubbed down with prosaic soapsuds sooner or later, but it is a pity to open the nursery door to wash-day fumes. The hand that rocks the cradle may be the hand that moves the world, but it is the dimpled fist within the cradle that feels responsible for the universe. Mature minds are so packed and jammed with ideas, even if they are not very good ones, that their owners often fail to realize the emptiness of immature ones, and how a thoughtless remark dropped into the little brain has room to increase and multiply to alarming proportions.

A certain grim instructress of the young made frequent allusions in the school room to the danger that menanced the country's water supply from the reckless felling of forest trees. Doubtless this cheerful subject was soon driven out of her memory by a crowd of metaphysics, hygiene, philanthropy, and what not. But her small pupils had no absorbing interests with which to eject the ghastly apprehension. One of them—no longer a small pupil — remembers lying awake whole feverish hours at night with the dread of choking and of seeing her family choke. It was maddening to fancy the dear mother with distended eyes and parched and lolling tongue. This wretched, diminutive sufferer, when she should have been bounding America or conjugating the verb "To Be," hatched plans and petitions piteously worded with a badly spelled hope of softening the hearts of the cruel men that in some vague place, and in some vague way, were at work upon the nation's trees, to the future destruction of her family, and incidentally of herself. The same person recollects a blighting frost that spread over her small spinal column when men and women old enough and wise enough to know better, talked in her presence of the supernatural. A conglomeration of the uncanny, even if it is prefaced with the remark "I don't believe in it, but it certainly is mysterious," is hardly a wholesome lullaby for an emotional child. Guardians of youth seem to imagine that young ears are deaf ears whenever it is convenient for their own purposes so to treat them. Those who would never think of deliberately discussing horrors with children will talk over any amount of hideous detail in their presence. Since a child is omnipresent in the household to which he belongs, it is a severe strain upon parental patience to arrange that he be fed upon nothing but nourishing conversational diet. But this is one of the penalties of parentage.

No matter what the after training of men and women, whether it is of ethics or of evil, it is largely with the vision acquired at home that they look into life. It is useless to drum the eighth commandment into a small man's ears if his father entertains the dinner table with applauded accounts of his own youthful peccadilloes in the path of pilfering. No son can be made to understand why it was funny for his father to steal watermelons from innocent farmers, and wrong for him to help himself to his mother's cake. The same rule applies to truth. A father should not flaunt before his children the fact that he told falsehoods—if ever such clever ones—to his elders in his own youthful days. It may be gratifying to have your offspring know that you could do something that George Washington could not. But that is hardly sufficient excuse. Another active grievance of the young is a certain nagging of their parents in an altogether unlooked for direction. There is a venerable newspaper joke about a father who took his small son off into the country for a stroll and there held his cane over his head while he pronounced this sentence: "Enjoy yourself now or I'll thrash you well." The facts of primary life are quite as amusing. One brawny father whose cane a scrap of a man can testify is no joke, recently presented this same scrap with a handsome bicycle, since which presentation their neighbors' lives have been made miserable. The consciously generous parent expects his son to show his appreciation of the gift by mounting and riding off with the pomp of a champion cyclist, instead of which there is every few minutes a bumping sound as of soft flesh coming in contact with a hard pavement followed by the refrain: "Oh, that's no way to ride! Don't you know enough to stick on?" Willy's father forgets that the laws of gravitation feel a strong attachment for a boy of five years on his first bicycle. Willy belongs to the humbler walks of life, so, although he has, as we have seen, his own woes, he is spared one phase of a miserable existence that falls to the lot of his more pretentious contemporaries. He is not dressed in the fantastic guise that brings down disapproving hoodlum fists. Artistic mothers should chain this fact to their memories; if they do not make men of their sons, the boys will, and that not so gently as they might have done.

Tell Why.

ALICE CHITTENDEN.

Implicit and unquestioning obedience in children is doubtless a beautiful quality, but, unfortunately, as rare as it is lovely. It was not until my fourth child proved himself to be of a most unbending nature, and the owner of very decided opinions, that it occurred to me to ask why parents should demand such unreasoning obedience, and if it were not just as well to take the little ones into our confidence and show them just why a thing should be done. It should not be beneath the dignity of a parent, when there is likely to be a conflict of wills, to get at whatever ideas on the subject may have lodged themselves in the small mind. A great deal of the trouble that parents frequently experience in the management of their children, I am convinced, arises from their unwillingness to treat them as reasoning creatures, and the balance from the fact that they do not begin early enough in life to write the necessary lessons on the blank pages of their infant's minds, not sufficiently realizing what creatures of habit they are. We are perpetually trying to unbend and reach down to them. Rudyard Kipling holds that children are very delightful companions if we can only reach up to them. We, not the little ones, lack comprehension.

It is much easier, I grant you, to say, "Mary, come and have your supper and be put to bed," than it is to call the little one to you, all unwilling as she is to leave her play, and explain to her, under cover perhaps of some little story, how desirable it is that little girls should go to bed early, with the birdies, in order to grow to be a "great big girl like Mamma." If you begin at a sufficiently early age, two or three times will be sufficient; by that time the habit will be formed, and she will feel when bed hour comes and probably ask to be put to bed. You must make allowance though for the strength that years bring, and let the bed hour be a little later each year, or there will soon be fresh mutiny on the part of your small subject. As Jock reached his third year I found it increasingly difficult to get him to bed at half-past five, so on his third birthday I took him on my lap and explained that as he was now a great boy he could sit up until six o'clock, promising that when he was as old as Tom he might sit up later still. I had no further trouble until he was well into his fifth year, when, unasked, and before he had time to grow restive, I again granted a reprieve. I find that this principle can be carried into the smallest details of everyday life. Always approach a child on the side of his reason. You can hardly imagine, until you have tried it, at what an early age he becomes companionable under this regime.

It is often especially difficult to teach a child proper table manners, but this, too, may be because we do not go about it in the right way. I was talking once with a young girl, the eldest of a family of eight, to whom I expressed my surprise at the readiness with which the children seemed to have acquired nice table habits in their family. "Do their manners never need correction?" I inquired.

"Constantly," she replied laughing, "but I think Mamma knows now, better than she did when Fred and I were young. We have a certain set of rules now, with fines for breaking them, and Mamma tells each one why such and such habits are wrong. I remember when we were young how frightened I used to be at dinner at Mamma's repeated 'Don't do that, Bessie.' I never understood what it was I was not to do."

Cannot we all remember some such incidents in our lives, and do we not often repeat them in the lives of our children? Tell the little one what is wrong, and why it is wrong, and he will forget the reason far less readily.

Taking Care of the Babies.

ANNIE HAMILTON.

Watching over the little one's diet is much, but not all. Hand in hand with it goes the care of the clothing in the providing of a system of warm but light clothes in winter and correspondingly cool and light clothing in summer—and untiring vigilance when changes of temperature suddenly occur to prevent the colds that, apparently so harmless, have really such great influence in the final result of health or weakness.

As to dressing the small, dear bodies wisely and well—that is a matter for individual study and the use of one's own good sense. In these days there is no lack of advice on the subject. Loyal allegiance to the laws of health, reason and common sense will provide very excellent rules. A certain amount of extra trouble in the way of putting on or taking off a little sacque whenever the temperature changes suddenly, is a good preventive against a cold. It is almost wonderful how the small bodies can be protected by these constant little precautions, and how blessedly few and far between will be the colds so common in many nurseries during cold weather, especially in our changeable country.

Two other cardinal virtues in the protection of little constitutions must not be forgotten, and should rightly have had their place with those already mentioned, regular and abundant sleep and pure air. The child's sleep should be uninterrupted and governed by strict laws as to regularity and amount. Only for regular meals should a little one be wakened—nature will attend to that duty. If it be necessary for him to be up at a certain time in the morning, and he does not wake of his own accord in due season, then he should be put to bed earlier at night so that he will have "had all his sleep out" and not be stinted. Nap times and bed times must come at the same hour each day to insure the greatest possible benefit. Nervous little temperaments that, most of all, need this precaution, are less easily governed by it, but habit is a grand task master, and with patience for aider and abettor, difficult things become easy by and by.

Pure air is as essential to perfect growth and development as the sunshine. Both together are more potent than all the doctors in Christendom.

but each is crippled without the other. In winter there is the especial danger of neglecting to give frequent and thorough change to the air in the childrens' rooms. These rooms should be vacated and the windows thrown wide open once and, far better, twice a day.

Of course the little folks should go out of doors as often as practicable and safe, and sometimes when this is out of the question, owing to the "walking," though the day is quite sunny and bright enough, it is a good plan to dress the little folks in out-of-door costumes and let them play a

FIG. 1. ST. VALENTINE FLOWER BASKET.

short time in a room with the windows open. But let it first be very certain that there are no direct drafts. And the playing should be out-of-door playing with plenty of exercise in it, as quiet, sitting-down games would be unsafe under the circumstances.

One might talk on and on without half exhausting this theme of the children's bodily welfare. It implies so much and involves so much, even to the third and fourth generation! Let us exert every power of our fatherhood and motherhood to the sending forth of our little ones into active life clad in the staunch armor of a good constitution.

St. Valentine's Day.

ELLA S. WELCH.

There is a curious record of domestic life in England, written during the reign of Charles II. and known as Pepy's Diary, which contains among instances of the observances of St. Valentine's

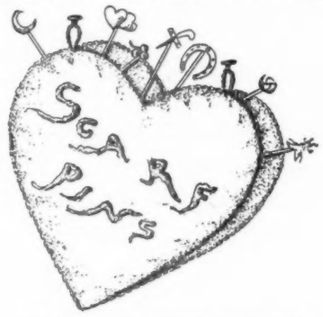


FIG. 2. ST. VALENTINE PINCUSHION.

Day then prevalent, the following: He says, "I am also this year my wife's valentine, and it will cost me five pounds; but that I must have laid out if we had not been valentines." Generally the proper ceremony was a kind of drawing of one's valentine by lottery, and the person so chosen was to give or receive particular attentions for one year, so that it is not surprising that arrangements of this kind often led to a closer tie. Now-a-days valentines are seldom used as messengers of serious love; nor are they, except among a cer-

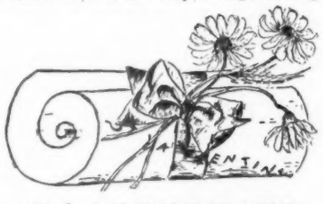


FIG. 3. A ST. VALENTINE SCROLL.

tain class, jocular missives, or vulgar, high-colored caricatures such as were only too popular a quarter of a century ago. The day is, however, one more of those gift days when friend can send token to friend. Lovers who have not yet declared themselves such find an excuse to send tender and suggestive remembrances, and I know of no prettier time to give a pleasing surprise to the very old or the happy young than on this day.

Flowers, of course, always make a lovely and appropriate offering. A fancy basket, fitted with an earthen dish, or glazed pan, may be filled with damp sand or moss and used to preserve cut flowers (Fig. 1), or with earth, in which blooming plants and ferns can be started. A card, tied to the handle by a pretty ribbon, may have the sender's name inscribed on one side, and on the other some quotation such as the following from Lowell:

"Our love is not a fading earthly flower.
Its wing'd seed dropp'd down from Paradise."

The quotation, of course, must depend upon the relations of the sender and receiver—it may be made friendly, tender or loving. Ropes of cut flowers packed in wet moss and inclosed in oiled paper and air-tight tin boxes can be sent through the mails, and those living in climes where flowers are almost perennial can remember less fortunate friends most acceptably in this way.

A trio of heart shaped photograph frames suspended from bands of ribbon, the frames made of Whatman's drawing paper, makes a pretty offering. To make these, cut two heart-shaped pieces for each frame; cut an opening, oval, square or diamond-shaped in the front and glue the edges together, leaving just enough space to slip in the

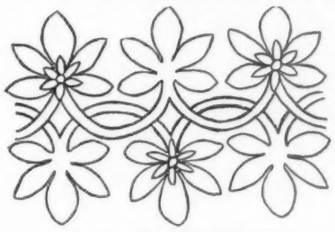


FIG. 1. OUTLINE PATTERN.

picture; paint with simple wild flowers and glue all when finished to two bands of ribbon, which are to be tied in a bow at the top.

A heart-shaped cushion for scarf pins (Fig. 2) makes a pretty token. Cover two heart-shaped pieces of stiff cardboard with velvet or plush; make a stuffed muslin cushion to slip in between and sew the outsides to this, which is afterwards covered neatly with a puff of silk of a contrasting color. To make the gift a valuable one add one or more scarf pins, or if intended for a lady, a few pretty stick pins.

A very dainty device suggesting thought and love, but not cost, is that of a sheet of heavy cream linen paper, upon which the sender has penned in quaint lettering some exquisite poem. It is then rolled like an old manuscript and tied with a pretty ribbon (Fig. 3). If it is not sent through the mails, a spray of cut flowers may be tied in with the knot; if it is, use pretty artificial flowers.

Pretty Outline Patterns.

The design shown in Fig 1 is worked in outline only, while the centers of the daisies in Fig. 2 are

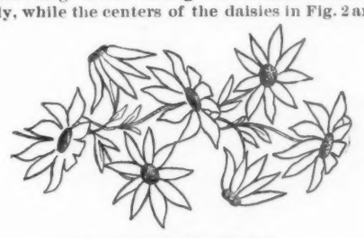


FIG. 2. DAISY PATTERN.

worked in knot stitch, and the remainder of the pattern in outline. These designs are very pretty for embroidering aprons, colored underskirts, children's Chambrey dresses, pillow cases, and the ends of bureau scarfs. For scarfs and pillow cases, white embroidery cotton is preferable, although colors may be used, if desired, but only white should be used for embroidering dresses. The most desirable colors for underskirts at present are black and white; black skirts should be embroidered with black, and the white ones with navy blue. These combinations are very fashionable, and much preferred to the easily-soiled white embroidered skirts for street wear.

Ribbon Guard for Baby.

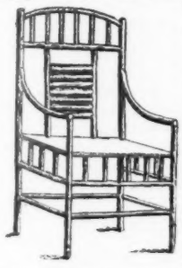
A pretty gift for a baby is a ribbon guard for its carriage or chair. Two pieces of two-inch ribbon, each a yard long, are required. For the model shown in our engraving one ribbon was cream

RIBBON GUARD.

white and the other pale pink. On the white one the word "Baby" was embroidered with pink silk in satin stitch. Along the middle of their length the ribbons were sewed together, over a canvas band, while beyond the band they were left free. A cross row of pink silk stitches was worked at each end of the canvas. It was used as a guard to keep the baby in his carriage, the ends being tied in airy bows to each side of the carriage front. A charming guard might be made of yellow and white—scattered yellow daisies on white ribbon or white daisies on yellow ribbon; also little white violets might be worked on blue ribbon and larger blue violets on white.

Homemade Rustic Chair.

Rustic chairs are not difficult to make, providing one has a pattern to follow. Such a pattern is furnished in the illustration, which represents a chair smoother than the conventional rustic furniture, in which projecting knots are exceedingly conspicuous, and frequently exceedingly uncomfortable. Smooth sticks,—smooth both as regards knots and bark—are easier to work and make much more attractive articles for the piazza or lawn. The seat of the chair illustrated is made of plain boards and covered with a generous cushion. The joints where strength is to be secured are of mortise and tenon, the latter being round and fitting smoothly into mortises made with a bit. Where no special strain comes upon the joints, as in the case of the short upright pieces under the seat and in the back, the joints may be firmly secured by the use of round-headed, black screws. Somewhat the same design, much elongated, may be used in making a rustic settee. In this case the pieces of wood should, of course, be considerably heavier than would be suitable for the making of a rustic chair, as the latter is to be easily movable.



COMFORTABLE RUSTIC CHAIR.

An Inexpensive Ottoman.

The ottoman illustrated herewith is made of a piece of plank about ten by fourteen inches, lightly padded upon the top and sides, and then

HOMEMADE OTTOMAN.

covered with a pale figured cretonne. The legs are simply iron clothes-press hooks screwed to the under side of the plank and gilded. A fringe

should be placed about the lower edge of the body reaching nearly to the floor; the fringe harmonizing with or matching the cover that is used.

Flax-Wheel Plant Stand.

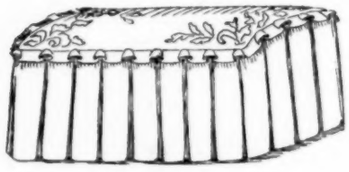
Old-fashioned flax-wheels are found in the attics and "storerooms" of many homes, the standard usually being among the missing. Our illustration shows how such a wheel can be utilized and

A NOVEL PLANT STAND.

made both ornamental and useful. Let a standard be found in the turned leg of some stand or table that has come to grief, and let it project through the "hub" of the flax-wheel to form a standard for a small circular bit of board that will hold one flowerpot, to fill the center of the ring of flowerpots that are to be placed upon the broad rim of the flax-wheel. The three legs can be formed of three pieces of ash from some broken tools, or of three pieces of ash cut from a board and bent into the required shape. The table should be screwed to the floor when completed, as otherwise it would be easily tipped over. Painting a rich red or a deep black, and varnishing, will add to the looks of this unique stand.

A Pretty Trunk Cover.

When obliged to keep a trunk constantly in a room where its homely presence is not wanted, it may be covered so as to make an attractive and quite comfortable seat. The accompanying sketch shows the arrangement of a cover which is so simply made that it calls for but little description. Any material suitable for a chair or lounge covering may be chosen. The smooth top is thickly padded with cotton and decorated with an artistic leaf design, which is heavily outlined with a couched cord. All around the sides of the top piece is sewed a deep box-plaiting of the material, which is folded down at the top to make a double frill two inches wide for a heading. Strong tapes sewed to the under edge of the top cover, front and back, are tied to the trunk straps, or through small screw-eyes, inserted just above the edge of the lid. The eyes do not materially mar the trunk, and they



DISGUISING A TRUNK.

may be quickly removed when not needed. With this arrangement the cover never slips off, and the trunk may be opened and closed at pleasure.

The Unlovely Trunk.

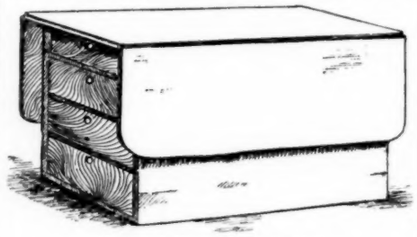
PRUDENCE RHODES.

A trunk is always in the way, except when it is in the baggage wagon or car. No matter how pretty or cozy one's room may be, once let a trunk become a part of its furniture, and its homelikeness is destroyed. A trunk suggests packing, chaos, disorder, moving, everything but a quiet, blissful, stay-at-home existence. If you board, it is often necessary that your trunk should share your room; in the case of summer boarders this is generally imperative. Even in one's own home there is often such a lack of garret or store room that a trunk must fill up some niche in the room of some one of the family.

It takes a very little ingenuity, however, to transform this obnoxious trunk into a pretty dressing table. If the trunk has a flat top, take a board slightly larger than its top and screw four legs to its under side, of such a length as to make the top of the table the right height. This must rest firmly upon the trunk. Around three sides of this board tack a frill of colored silesia, with dotted Swiss or lace-like scrim over it. Let this fall to the floor, and make a cover of the same materials for the top of the board just large enough to allow the lace ruffle to fall over the edge. Into the wall, three feet above the table, fasten a piece of curtain pole about twelve inches long, and about a foot below this, and a few inches either side of it fasten other pieces, with the ornamental brass end out. To fasten these securely, saw off a piece of pole and nail to it a beveled board about three inches square; this is to be afterward screwed to the wall. When curtains of swiss are thrown over these, they form a sort of canopy, and are to be tied back with ribbons to match the silesia. If the top of the trunk is not flat, a carpenter can fit a board on either end, to which the top board can be screwed. Should it be necessary to get at the contents of the trunk it will be quite easy to lift off the whole affair. Over the table, between the curtains of the canopy, hang a mirror, put your toilet articles on the table, and no one will ever guess that under its pretty drapery is concealed the unsightly trunk.

Remodeling a Kitchen Table.

"Service" is written all over a kitchen table, be it of what style it may, but the ordinary kitchen table with two leaves and four round or square legs can be made much more serviceable by a reconstruction according to the plan shown in the illustration. The four legs are sawed off close to the body of the table, and this will usu-



AN IMPROVED KITCHEN TABLE.

ally be about four inches below the top. In many of these tables the body part contains a drawer in each end. These are allowed to remain untouched, while below this is added a box-like arrangement, the exact width of the body of the table, in each end of which deep drawers are inserted, each set of drawers occupying one half the length of the table; the uses to which these can be put being too apparent to a housekeeper to need recounting. Such a metamorphosis of the kitchen table as this can be readily accomplished by any one at all handy with tools.

Arrangement of Upright Pianos.

MRS. E. F. HOLT.

Now that the upright piano is no longer placed against the wall, it is almost as difficult a piece of furniture to dispose of, with a view to artistic furnishing, as was the old-fashioned square piano. The fashion of the day is to place it near a window, a little to one side, where the musician will have the benefit of light for keyboard and music notes, thus bringing the back of it, which is anything but decorative, into full view and giving rise to the question, "What shall we do with it?" which has perplexed many a woman. Some thought as to shape of room and general furnishing should first be given before placing the piano. It need not of necessity stand exactly parallel with wall and window. It may be placed in positions which are less prim. Turn it a little to one side if by so doing you do not sacrifice the light, but secure a better position by an oblique view of the back. One of the most popular ways for treating it is to place a threefold screen sufficiently high to reach the top of the piano, so that it entirely covers the back. This screen may be as decorative as desired and be made to serve other purposes as well. Portfolio pockets for holding photographic views and etchings and bands of ribbon strapped across the folds may serve to display photographs of famous men and women and form an interesting background for a low divan, or a tête-a-tête seat.

A most effective arrangement is shown by the accompanying sketch. The back of the piano is first covered with velveteen or plush of a rich, deep

ARTISTIC PIANO DECORATION.

mahogany shade, the edges being turned in and tacked to the frame with tiny upholsterers' tacks. Over this is then arranged a breadth of silk, such as comes for window draperies in oriental coloring and design. Drape this, as shown in the engraving, across the top and falling to one side, and confine it by means of the small tacks placed under the folds. Place before it a small table for holding bric-a-brac and books. It should have a table cover to fall well over it, and thus serve to conceal the lower part of the piano back. The cover should be of white material to show plainly against the darker background, the embroidery to be of colored wash silks and wash gold thread. Thus the effect of both harmony and contrast with the oriental drapery will be carried out.

A potted palm in a tall china jar is placed at the left of the table, a little to one side of the piano. A rubber plant or wide spreading fern would be equally effective, and serve to screen that side of the piano which is not draped.

A Milk-Room Device.

What housewife has not had trouble again and again to tell just how old is the milk in each pan in her milk room? When the same number of pans are used at each milking, and these can be always placed in regular order upon the shelves, there may be little danger of getting Tuesday morning's milk mixed up with that of Monday night; but sometimes there is room for only a part of the pans upon one shelf, and so some must be placed out of order, or an unequal number of pans may be used; and in these ways uncertainty often

LABELS FOR MILK PANS.

arises as to the age of the milk. This trouble may be obviated by the device shown in the illustration. Slips of wood, narrowed at one end and having a slit just large enough to slip upon the edge of a pan, are made as shown in the sketch. Let there be a sufficient number so that as many may be marked "Monday morning" as would ever be wanted to accommodate a single milking, and let an equal number be marked "Monday evening," "Tuesday morning," and so on through

the days of the week. By this means a housekeeper can always be sure before she disturbs a pan whether it contains double or triple cream.

A "Charmed" Cushion.

The pretty cushion shown in Fig. 1 is covered with pale clover-red satin, on which is embroid-

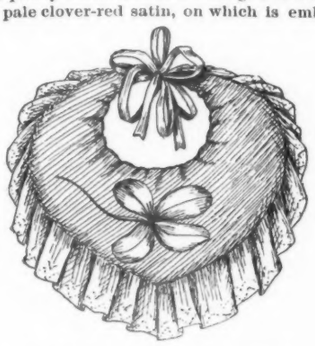


FIG. 1. A CLOVER LEAF CUSHION.

ered, as a charm for good luck "in love and all things else," a large four-leaved clover, in its own natural shades of green. The edge is finished with a ruffle of embroidered silk muslin, in the lightest shade of green used in the leaf, and the points of the cushion are tied together at the top with narrow ribbons of the same shade. Not as delicate in effect, but very charming, is a cushion of golden yellow satin, with the same trimming as the former. Soft, yielding goods are better for such cushions than those of firmer texture, and all sorts of decorative designs, such as horseshoes, wishbones, and so on, with laces, ribbons, cords, gold thread, and trimmings innumerable, may be tastefully arranged to produce a great variety of

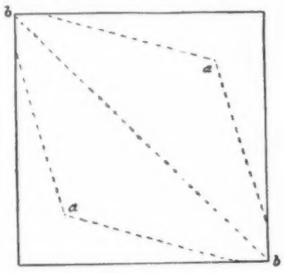
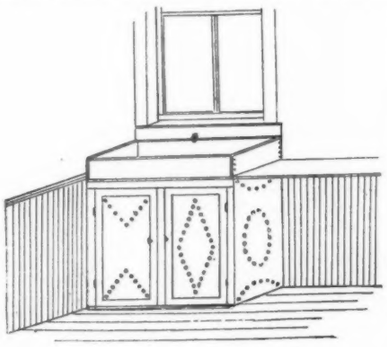


FIG. 2. DIAGRAM OF CUSHION.

these "charmed" necessities for charity sales, or for gifts. A ten-inch square of satin is required for a cover. It is shaped from a square like that part of our diagram seen in Fig. 2, which is enclosed by the two dotted lines, and is folded at the diagonal line of dots, *a* and *a* coming together; *b* and *b* form the points which meet at the top.

Ventilating a Cupboard.

Cupboards located under shelves in the pantry and sinks in the kitchen soon becomes damp and foul for want of proper ventilation, for the reason

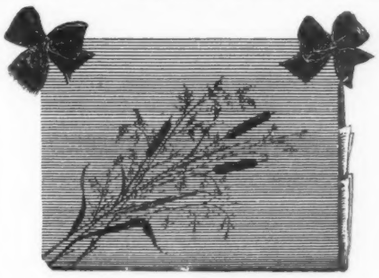


VENTILATED CUPBOARD.

that they are ventilated only when the doors are opened for the purpose of removing or placing in them some utensil. Pots, kettles and tinware placed therein become moldy and rusty unless in daily use. This trouble can be overcome by simply making holes in the sides and ends, as shown in the accompanying illustration. Half inch augur holes are most desirable, and may be made in a cupboard already in use. By placing pieces of charcoal, chloride of lime or a piece of unslacked lime in the cupboard the atmosphere will be sweetened, which in connection with the ventilating holes will keep things in better condition.

From a Reed Splasher.

Many useful and pretty things can be made from the reed splashers after you are tired of using them in that capacity. A large one will frame a long, narrow mirror to be placed over a mantel. The mirror must be only a trifle smaller than the splasher you are going to use. Cut the opening with a sharp penknife; turn the ends over on the back of the glass, stretch a piece of muslin over the back and sew it on the turned over ends. Slip in the glass and paint the frame with any pretty design, letting a part of it run over onto the glass. Photographs may be framed in the same way. The simplicity of the wall pocket shown in our sketch will commend itself to every one. Simply fold a splasher of the ten-



A SPLASHER WALL POCKET.

cent size and sew good-sized brass rings to the corners to hang it up by. Ornament at the corners with bows of ribbon, and on the front sew cattails and dried grasses or peacock's feathers, or paint with any pretty design, if preferred. These trifles sell well at fairs. Attractive covers for flower pots can be made from these splashers. Fit the material snugly around the pot and cut it the desired depth; sew it top and bottom, run the ribbon through, drawing the lower bands up to fit the pot and tie in a bow. Cut the top in points and attach a fluffy little tassel at the base of each. Where the material is cut lengthwise, be careful to tie the cords or it will ravel badly.

Cushion for Chair Seat.

A lovely cushion for a large cane or willow chair is shown in the accompanying sketch. The stout

EMBROIDERED CHAIR CUSHION.

lining is boxed all around the sides with a two-inch band. The embroidered velvet cover is not quite as large as the top of the cushion, and the under cover matches it in size and shape. Between the two, covering the edges, is a puff of satin of a shade which harmonizes with the embroidered blossoms. At two corners are fastened large silk-crocheted rings, firmly sewed through to the lining. Ribbons may be passed through these rings, then around the chair posts, or through some openings, and be tied in pretty bows outside the chair.

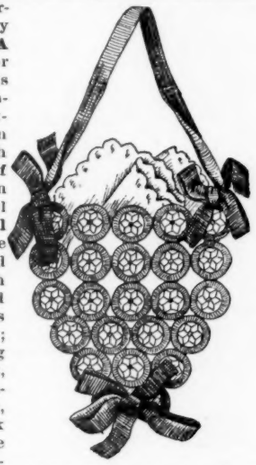
Facts About Whalebones.

DORA HARVEY VROOMAN.

In buying whalebones for a waist, select those that are flexible rather than those that are stiff. The former bend to the shape, yet hold the waist in position, while the latter are apt to snap or break. If a bone becomes very much bent, do not throw it away as worthless, but hold it close to the fire or lamp chimney, and the heat will straighten it out as good as new. Hold the bent or curved side towards the heat. It is best to buy bone by the yard and cut lengths to suit. You can buy casing or covering for them for about five cents a yard; it is double so that the bone can be slipped down the center. The metal "bones" are very good when first put in, but they are apt to break and then the jagged ends pick holes in the dress material.

Handkerchief Pocket.

There are always those who, regardless of the edicts of fashion, will have a pocket of some kind in which a handkerchief at least may be safely carried. A favorite design for such a pocket is shown in our engraving. For making it, four dozen three-quarter inch rings, one yard of half-inch ribbon and part of a ball of crochet silk will be required. The rings are crocheted singly, filled with lace-stitch, and sewed together, as seen in the sketch; twenty-four being used for the front, and the same number for the back, although the back is sometimes made of thin canvas covered with the dress material. One-third of the ribbon makes a pretty bow for the bottom, and the rest is used for a suspension loop and a bow for each upper corner. A little bow at the top, where the loop is pinned to the belt, would be pretty if the pocket is to be worn with a round waist. Such pockets are prettiest if made in colors to match the gowns with which they are to be worn; but black pockets are often worn with gowns of other colors.



PRETTY POCKET FOR HANDKERCHIEFS.

A Dainty Little Dress.

The little French Mother Hubbard dress, shown in the accompanying illustration, is for a small lassie of two years old and upward. A daintier fashion of making could hardly be devised for the tiny toddler, or her older sister of four or five or six years' experience in the world. We want to keep our little ones babies as long as we may, and we are too wise to think that over-much ornamenting of the bits of gowns will add in any measure to their beauty. Simplicity belongs to the babies, as their most precious inheritance, and when we consult the "eternal fitness of things," we shall fashion all the small dresses as simply as possible. This little gown in the picture is surely simple, and is it not pretty? It is made of soft, gray flannel with pink feather-stitching for trimming. The body of the dress is cut with shoulder straps, and between the straps is gathered with a little ruffled heading and sewed to the round yoke, being careful to follow the curve truly. A broad hem with feather-stitching outlining it finishes the bottom. The sleeves have deep, fitted cuffs and full puffs overhanging them, with the stitching at the little wrists. A round collar shuts in the soft little throat. It must be made in two parts, as the dress opens behind, but that adds to instead of detracting from its beauty. Of course it is feather-stitched all around, and the stitching runs up over the shoulders too, at the inner edge of the shoulder straps, ending just where the fullness begins. When the simple little dress is finished, and you have your baby in it,

FRENCH MOTHER HUBBARD DRESS.

I think you will agree with me that it is wonderfully pretty. The combination of gray and pink is beautiful, but numerous other colors might be combined harmoniously, and to each one's individual taste. Another little dress made in the same way might have the yokes and the entire sleeves of a contrasting color to give the perfect effect of a guimpe, and possess the advantage of being easier to make and easier to put on and off. In this case the whole sleeves must match the yoke, as making the cuffs only to match will destroy the semblance of a guimpe. Although the French Mother Hubbards are a little more difficult of construction than the original Mother Hubbards, they more than repay the extra stitches and "fussing" by their artistic effect. It is wonderful how the little shoulder straps and the rounding curve of the yoke changes and improves the whole appearance of the bit of a toilet. When the dress is for a two-year-old, it must reach nearly to the floor, but it grows shorter as the years grow longer! By and by it reaches the knees, and presently, then, it may be getting time to vary it with a gown for grown-up people, but I should not be in the least hurry to do it.

A Ribbon "Spare-Hand."

SPARE HAND.

For the convenient little spare hand, seen at the right of the accompanying sketch, make a full bow with two ends nearly a yard long; sew a clasp pin at the back of the bow, and tie another one on each end in the manner shown by the larger figure at the left of our sketch. It is designed to be pinned to the belt or skirt, a little to the right, the ends falling freely at the side. It is used, when sewing, to support scissors or shears, holding an emery cushion, a self-winding tape measure, or any little thing constantly needed. There may be three or four ends, if desired. One made of pretty braid, tape or cord would be handy for a cook. Two holders, or small oven cloths, might be attached, and removed when not in use. This contrivance will save many steps.

Two Uses for Horns.

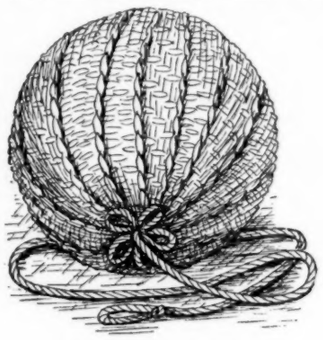
Cattle horns are often so beautiful in shape and in the waxy clearness of their coloring as to make them exceedingly appropriate for ornamental work. The illustrations herewith show two ways of utilizing these articles, the one with chain and hooks, seen in Fig. 1, being for the hanging up of keys or trinkets of any sort. The chain is attached by very small screw eyes. The base has a piece of wood fitted into it, and this is covered with plush. The other horn (Fig. 2), has a tin cup fitted into the base and is secured to the wall in an upright position by a piece of ribbon passed through two screw eyes screwed into the wall near together. The horn then becomes the receptacle of cut flowers. A high polish upon cattle horns adds very greatly to their appearance, and should be secured when the best effect is desired.

FIG. 1. ORNAMENTAL CATTLE HORN.

FIG. 2. ARTISTIC FLOWER HOLDER.

Jingle Ball for Baby.

A charming but simply-made toy for a baby is a "jingle ball," made in the following manner: Put into a small, round tin box an old-fashioned sleigh bell, or two or three little round, tinkling toy bells. Place on the cover and wind narrow strips of any soft cloth over and around the box to form a soft, round ball; then smoothly wind on bright colored wool until there are three or four layers of it outside the cloth. With a needle and odds and ends of wool in many colors take rather long, irregular, interlacing back stitches into the cover, round and round the ball, to bind it on securely and dot it all over, as seen in our engraving. Work the

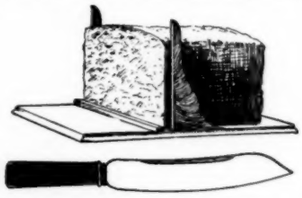


BABY'S JINGLE BALL.

"meridian lines" last, in outline stitch, with wool of one color. Make a long cord of twisted wool, fasten one end firmly to the ball with five little loops, and finish the other end with a single loop. Slip the single loop over any convenient projection to secure the ball from rolling away—and baby will enjoy its soft jingling and pretty colors as he tosses, rolls and draws it about.

Bread Board with Gauge.

Some housekeepers have so mechanical an eye and hand that they can cut a whole loaf of bread into slices, every one even and of about the same thickness, but the majority will confess that they are often troubled by the uneven appearance of the slices of bread upon their tables. The bread board shown in the illustration will remedy the



CONVENIENT CONTRIVANCE FOR CUTTING BREAD

difficulty, and not only make all slices straight-sided and even, but all exactly the same thickness. Its construction will readily appear, it being only necessary to remark that a bread knife should be broad in the blade and of extreme thinness, one like the knife shown in the sketch serving capitally. A handy blacksmith ought to be able to fashion such a knife from a bit of thin steel.

Match Holder.

The simple beauty of this little match holder commends it to every one who sees it, yet it is made of nothing but one of the little jars that extract of beef is put up in. Though the model has often been admired, no observer has suspected it was ever anything but what it now seems, a dainty little ornamental holder made expressly for matches. Many who use the beef extract throw away the coverless jar, thinking it of no account, without ever knowing how pretty it is when the printed labels are soaked off, revealing a smooth, solid little jar of mellow ivory-white, almost unbreakable, impervious to water or any common degree of heat, and of just the right height to be convenient for holding matches; while the little groove near the upper edge seems made to keep an encircling ribbon in place. The model shown in our engraving has a yellow ribbon tied around it, and the word "matches" is printed, as shown, with deep yellow liquid gold. Another holder had red ribbon and was lettered with red in oil color, and liquid bronze, and still another, designed for a gift, had blue ribbon and little blue forget-me-nots scattered all over it. Such a gift could not fail to be pleasing and useful, for a safe match holder of some kind is needed in every room in a house if conflagrations are to be avoided.

NOVEL MATCH HOLDER.

Making a Writing Chair.

Those who have written upon the broad, flat-armed chairs or seats in a college or school lecture room know how easy it is to write with such a convenience. A substitute may be found in the flat-armed piazza chairs with woven backs and seats, that are so common. Let the outside edge of the right-hand arm be sawed or planed to a straight edge, and a leaf attached to this edge by small hinges. This leaf can be folded down beside the chair when not in use, and raised when one wishes to write. It is secured in a horizontal position by a swinging arm fastened at one end to the under surface of the arm of the chair, and swinging out under the leaf when desired, as in the case of the leaf of a table. If more rigidness is desired,

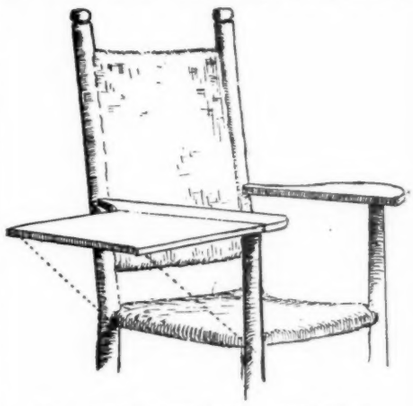


FIG. 1. CHAIR WITH TABLE ATTACHMENT.

so that books can be placed upon the shelf, two braces can be placed in the position indicated by the dotted lines in Fig. 1, sockets being made for each end of the brace to fit into. In Fig. 2 is seen the chair with the swinging arm down.

Those Wicked Steps.

FLORENCE HULL.

Devoted housewives are not rare. And by this phrase I mean women who are devoted not so much to the individuals in their family, as to their collective interests. They toil for the welfare of the

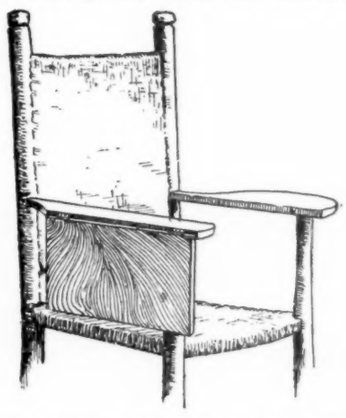


FIG. 2. TABLE ATTACHMENT FOLDED DOWN.

household, and they think it almost wicked to spare themselves, and come at last to reckon duties performed by the number of aches and pains they carry about in their bodies.

Now, I have watched, with admiration, some of these patient, conscientious sisters going their daily round in the treadmill, and in studying how their onerous labors may be lightened. I was

helped to a conclusion by noticing the persistence with which certain obstacles to work intruded themselves, and the quiet way in which they were disregarded and kept unnoticed.

Let me tell a little story. Away up in the Shawangunk hills there is a farm on which the dwelling house is a pretty, gable-roofed cottage, unusually well built and commodious. But the man who had the planning of the dwelling did one of those little things whose thoughtlessness ought to cause his expulsion from the list of architects. He made the kitchen lower than the dining or living room, and placed three steps at the door. The kitchen is small; there are daughters in the family, pretty, growing girls with tastes toward the refinements of living, and the mother is industrious and ambitious. Need there be further explanation? I have seen that woman—and she is a very large woman, heavy on her feet—toil up and down those three mean little steps between the kitchen and the sitting-room more times a day than I dare state. First with the dishes, for by some impish trick of ingenuity, the dish closet is in the sitting-room; then with the smoothing irons, then with pails of water to pour on the window plants, and now with one thing and another, until my pity was lost in amazement that such things should be while there was a carpenter in the country to cut a shelf window between the two rooms, or to do away with those wicked steps.

Evening Toilettes.

"I must have a few rags, you know!" exclaimed a gay prospective bride to the French dressmaker, of whom she was ordering her *trousseau*.

"Oh, my dear, do not say rags," corrected the shocked modistè, "say *chiffons;* it sounds so much better," and it is chiffon—if not *chiffons*—that I want to commend to the girl who is fond of society, but whose limited pin money may forbid a brand new party gown this season. Pretty, sheer and very stylish is the fabric known as chiffon, and, although in time sure to degenerate into the tatters from which it derives its name, still, like charity, it covers a multitude of defects and makes old things look "amaist as gude as new."

Accordion-pleated black chiffon will transform the plainest of silks into a full dress costume; while the white and pale tinted will revivify a light hued frock most wonderfully. To do this properly, the old silk waist must be neatly covered with the airy material, care being taken to avoid a baggy effect. The neck may be cut either round or square, but, in either case, finished by a deep, full bertha of chiffon, while the same forms puff sleeves, ending just above the elbow. If, however, a high bodice is preferred, a chemisette of chiffon is attached under the bertha and drawn up around the throat, while a silk skirt past its first freshness will look exceedingly well veiled by accordion-pleats of the transparent goods, which should cover it entirely. Lace can likewise be employed in the same manner, and will, undoubtedly, prove more serviceable, but its first cost will likely be more, and it is rarely so becoming.

Young maidens often choose for their first new evening gowns the dainty white chiffon over white satin, and look very sweet and girlish in the full gathered infant waists confined by a moiré sash, and with a tiny ruche of box pleated chiffon around the neck. But for new evening toilettes plain, rich satin or clouded moiré is generally selected, while next to white, pink seems the most favored color; although blue, lavender, yellow and pale green are all worn. These dressy gowns are cut only moderately low around the neck, always covering the shoulder tips, and the sleeves consist of elbow puffs of satin with lace frills below. The skirts are still wide, just touching the floor, and in the back are arranged in hollow godet pleats kept in shape by stiff linings and by a reed of aluminum, which is fine and light as wire, inserted around the foot about an inch from the bottom. Contrary to early predictions, narrow bands of fur still outline the necks of evening dresses, as well as ruches, galloons and folds of satin. A round bodice is usually liked best, though pointed ones are as good form, when more becoming. For a short-waisted person, an excellent fashion is a row of squares or small loops set on the sides of a pointed bodice, falling over the hips and giving the effect of a short basque.

For small companies and receptions the English style of embroidered or braided cloth dresses is appropriate. Some of these are trimmed with ribbon applied in zigzags; but the prettiest are braided with a fine silk cord. Sometimes this forms a running pattern all over the cloth, but oftener merely decorates the top of the waist, sleeves, waistband and foot of skirt. A stylish combination, also, is braided satin, with broadcloth of the same color. Matrons may wear trains, but for young ladies they are not at all in vogue. Nearly everyone, however, desires a handsome black gown, and the most elegant are of moiré antique trimmed with white Venetian lace. Black brocade and black cloth are also very stylish, the latter being particularly pretty when used as a waist and overskirt over a satin skirt, and showing facings of some bright hue. Indeed, most somber costumes are now enlivened by a touch of color, and variety can be obtained by hanging several soft, stock collars of velvet or satin in various tints, as rose, white, Nile green, turquoise blue and yellow to wear with a black gown. Two waists, too, are extremely useful, one being a long coat to the knee, opening on a vest of fancy silk, and the other a round bodice cut low in the neck, filled in with chiffon, and trimmed with lace and jet ornaments innumerable.

Unless the slippers be fashioned of a piece of the dress material, they are most elegant of white satin, though undressed white kid and Suede are also worn. These have a sharply-pointed toe, moderately high, sloping heels, and are often ornamented with a spangled rosette. The long mousquetaire gloves of Suede are pure white, or else have just a tinge of the hue of the gown. They always reach to the elbow, and sometimes above. The arrangement of the hair is quite simple, even for very ceremonious occasions, the knot formed of a high loop surrounded by a twist and having a sort of helmet effect on top of the head, perhaps, being most popular; but ornaments are profusely worn among the tresses. Jeweled hairpins, small filigree combs of gold and silver, and cockade bows of satin ribbon, are all fancied by young ladies, while matrons affect coronet fronts and very occasionally even entire crowns of jewels.

Some Winter Salads.

As winter wanes and spring approaches, salads appeal very strongly to our appetites. If they can have some touch of green in them so much the better. If one has taken the precaution to make a hotbed so that he can regale himself on lettuces, he has something far superior to medicine that may, and certainly will, if freely eaten, save a doctor's bill. They are an almost certain specific for nervousness and sleeplessness. But if one has no lettuce bed there are many other healthful salads that may be eaten in February.

Boiled Salads.—Perhaps it has never occurred to some housekeepers that the remains of an old-fashioned boiled dinner could be converted into a very pretty and delicious salad. Equal parts or any proportions of the different vegetables included in the dinner can be used. By arranging them in layers on a flat dish they may be made very pleasing to the eye as well. Make a little mound of dice of potatoes, then one of red boiled beets, then one of turnips, next carrots, then cauliflowers, then string beans, and in the center a little mound of the cold meat. Parsley and turnip tops (the young sprouts which grow in the winter) may be used for decoration. The best dressing is the plain French dressing; three tablespoonfuls of oil, one of vinegar, and salt and pepper. Melted butter, cream or sweet bacon drippings can be substituted for the oil, but should not be mingled and poured over until the salad is about to be eaten.

Beet Salad.—This is a very beautiful winter salad. Boil half a dozen beets slowly until tender; throw into cold water; when cold remove the skins; cut in two and slice neatly each half; place them in the center of a salad bowl; slice three boiled potatoes and lay them about the beets. Have ready four hard boiled eggs, mince white and yolks separately, and arrange the former around the salad in little heaps alternately with tufts of water cress; sprinkle the yolks on the beet in the very center, leaving a border of the bright red beet to be seen. Thomas J. Murray, caterer of the White House restaurant in Washington, manages to raise winter salads in the following ingenious manner: Saw a flour barrel in two after heading up to make two tubs; put in rope handles by inserting rope through holes bored in each side opposite each other; bore holes from one to two inches in diameter in circles around the tub; cover the bottom with stable sweepings, over this add loam to come up to the first row of holes; now plant beets so that the crowns or leaf ends will come opposite to the holes, cover with rich soil to the next row, and so continue until the tubs are full. Keep in a warm and rather dark cellar, turn to the light occasionally, water well, and in a short time the beets will sprout through the holes and furnish winter salad greens. Plant the top of the barrel with mustard, cress, spinach or other small salad plants, which will grow profusely and allow constant cutting.

Herring Salad.—Broil half a dozen of the small dried herring or two of the larger kind, or two of the Yarmouth bloaters; remove skin and bone and cut the fish into shreds; add an equal quantity of sliced boiled potatoes; sprinkle over minced parsley and chives, and serve with a plain salad dressing. If garnished with a head of lettuce or bleached endive or with water cress, it is much improved. The French add two anchovies and a dozen capers to this quantity.

Baked Bean Salad.—A pint of cold baked beans and a head of lettuce or endive, or a handful of cresses, makes an appetizing salad for a Sunday night supper. Boiled Limas (the dry beans), drained, cooled and added to an equal quantity of sliced, cold, boiled potatoes make an excellent salad. Sprinkle with minced herbs, and serve with plain dressing. Lay a crisp leaf of lettuce on a plate and place upon it a heaping spoonful of the above salad, passing toasted crackers with it.

Calf's Head Salad.—The tongue and meat from a calf's head is nice served in a salad. Cut the meat in pieces half an inch square and lay for half an hour in a dish with two spoonfuls of salad oil, three of vinegar and a seasoning of salt and pepper, drain and mix with an equal part of cold boiled vegetables cut in dice in the proportion of two parts potatoes, one of carrot and one of beet. Mince a little water cress, mix it with the oil and vinegar in which the meat was laid, and place as a garnish. A mayonnaise is best with this salad.

Mayonnaise.—Cotton-seed oil makes a nutritious and good flavored mayonnaise that only an educated palate can tell from one made with the imported olive oil, and at less than half the cost. It is so simple a matter to make a mayonnaise that it is strange that housekeepers should ever have the slightest difficulty. Given a cold, fresh egg and a bottle of oil, chilled in the ice box in summer or a cold place in winter, and a mayonnaise is one of the easiest matters in the whole culinary repertoire. Break the yolk of the egg into a wide, shallow dish; beat until smooth, always one way, and then add the oil, slowly at first but by no means drop by drop. As soon as it begins to thicken, which will be in a few seconds, add the oil more rapidly, thin with vinegar or lemon juice when it becomes too thick, and season to taste at the last.

New Window Draperies.

HELEN M. PRATT.

Curtains for the summer home, or for sitting and bedrooms at any time of the year, are prettily woven in silk stripes on a cotton or linen ground, and are very effective draperies. In general, the grounds are a trifle darker than they were last year, as the pure white grounds were too quickly soiled. Cream or ecru, with apple green, Nile green, pale blue, or rose, or, prettier still, an artistic combination of all these delicate colors finished with a fluffy sort of combination fringe border, gives a light and cheerful effect, and has the advantage of harmonizing with the general tone of most rooms. The stripes run crosswise of the length. Tambour curtains are still shown and are always a good and serviceable choice. Irish point remains the favorite for more expensive curtains, unless one can afford the fine, filmy French laces. The coarser patterns of Nottingham lace should be avoided. They are much less desirable than the less expensive but more artistic muslins or even the best patterns of silkaline. China silk is not so much used as formerly, though still seen in many good houses. A pretty choice for a summer curtain is the dotted or lozenge-spotted white muslin, trimmed on the long edges with a narrow hemmed ruffle of the same and tied back with fresh ribbons, white or colored, to harmonize with the tones of the room. These are easily laundered, and even if not the finest quality have the advantage of freshness, drape gracefully, and are exactly what they seem to be. The lace patterns for the curtains are unusually large and graceful this season.

The Young Egg-Gatherers.

AD H. GIBSON.

The bright rays of the morning sun were gilding the waves of the Pacific, as Will and Lela watched their father depart from the shore in his boat.

He had a load of seafowl eggs, which he was taking to a California town on the coast, where he would exchange them for such things as were needed at their island home. "I'll be home as early as I can," he called back to his children, smiling a pleasant good-by.

Will and Lela waved their hands in reply, and watched the boat as it skimmed along over the waves, like a graceful water-fowl, until it became a mere speck in the watery distance. Then they went back up the steep hill to their lonely little cabin, which nestled, like some great eagle's nest, far up among the blue bluffs of that wild, rocky island. The boy was soon busy mending a fishing net, while his sister washed up the breakfast things—duties which the father's early departure had delayed.

Mr. Watkins and his wife had been early settlers in California. Among the rugged scenes of a mining camp Will had been born, and nearly four years after Lela, who was the pet of all the miners. Mr. and Mrs. Watkins realized that the mining camp was no fit place for the training of their children, and as soon as the "Little Tiger" began to yield flattering returns for the labor expended in it, they resolved to quit the mines.

Leaving his partner, Theo Burris, to look after his interest in the Little Tiger, Mr. Watkins had removed his family to San Francisco, where Will and Lela would have some opportunities to secure an education.

Imagine the father's feelings when, a few months later, he returned to the mining camp to see how his interest had progressed, and discovered how cruelly his trust had been betrayed. Burris had sold the Little Tiger to an Eastern man for a snug fortune, which he had put in his own pocket and left the gulch for parts unknown. The Eastern speculator had sold it to a mining company, which ignored the claims of Mr. Watkins. Encouraged by the advice of a lawyer, the latter had begun suit to recover his interest; but he had not the means to cope with a wealthy mining company, and it required but a short time for the lawyers to swallow up what little the miner had saved from his hard labors.

One trouble usually brings another. No sooner had Mr. Watkins lawed away his savings than his wife sickened and died, leaving him a broken-spirited, disappointed man, with two children to care for. With faith in mankind almost wrecked, the crushed man had taken his children and few household possessions far away from all schemers. On this lone, rocky isle in the sea, off the coast of California, for five years the sole inhabitants, they had been living their quiet, but not unhappy, life.

The seafowl eggs were considered very wholesome, and the young gatherers spent much of their time hunting for the nests among the rocks. However, they never made a habit of robbing all the nests which they found. Will and Lela were very humane, and exceedingly careful to leave a sufficient number of eggs to bring forth many young birds.

As the sun began to decline beyond the island bluffs on the day of their father's departure, Will and Lela each took a small willow basket and started away to the rocks to look for seafowl eggs. After they had climbed many rugged and dizzy ledges, securing almost a basketful of beautiful eggs, Will said:

"Now, Lela, you sit down here and rest while I go to Pilot Rock and get what eggs I can find there."

"No, Will, I want to go with you," she answered.

"But it's such a rough climb for you."

"I don't mind climbing Pilot Rock a bit," she returned. "Then, I'd rather go with you than wait here."

"All right, then," he replied. Will really enjoyed having Lela with him, and though she was nothing of a tomboy, he voted her "a jolly good fellow."

Pilot Rock was a bold promontory of the bluffs at the extreme western part of the island. It resembled the half-crouching form of a huge old, gray giant, staring far out across the ocean. The sun's dying rays struck the promontory obliquely, tinging its rugged gray outlines with delicate rose and gold.

Reaching Pilot Rock, Will and Lela ascended the steep slope and began to search the ledges for eggs. When Lela had gained the base of the promontory, she got on her knees to gaze far down at the little cove which jutted in among the lesser bluffs below. In a moment her face, flushed with the exercise from climbing, turned very pale, and her eyes shone with excitement, as she called,

"YOU MUST HELP CARE FOR HIM, FATHER," SAID HIS LITTLE DAUGHTER. "NEVER!" WAS THE REPLY.

in a strange voice: "Oh, Will! Come quick and look down Pilot Rock into the cove. There's a boat there, and—"

"A boat there?" cried Will, in surprise, hurrying to his sister's side.

Boats did not often visit that lone, rocky isle, and the cove beneath the frowning visage of Pilot Rock was no safe place in which to sail.

"Yes, a boat," she returned, excitedly. "And oh, Will, there's a man in it. He's lying flat on his back, and his face is so awful white. Do look!"

Will flung himself on the rocks beside his sister, and was soon gazing at the object which had so completely startled her. In the bottom of the boat could be distinctly seen a man's prostrate form and the side of a face, white as the dead.

"What if it's father?" said Lela, in a frightened voice.

Will's own heart had been throbbing with the

same unasked question. "I must get down there as soon as possible," he said.

"Yes, but how?"

"I'll have to go down and go around the bluffs," he answered, rising. There was no other way for them to reach the boat and its silent, white-faced occupant.

Their hearts were filled with strange fears, as they picked their way as speedily as possible among jagged rocks and over dangerous ledges toward the cove. But he was not their father.

Closer examination revealed the startling truth that the man's heart was faintly beating, and that there was a great gash on the side of his head.

"Poor man!" said the little girl, softly, as Will bent over the body in the boat which was securely wedged in between two large rocks.

"Here, Lela," said Will, "dip up some water for me. We must try to bring him back to life. If we could only get him to the cabin I think we might revive him yet."

"I wish we could, Will!"

"But we can't carry him over the bluffs, and father won't be back till late," said the boy, thoughtfully.

"I'll tell you," he went on, suddenly. "If I had the oars up at the cabin I could loosen the boat, run out of the cove, and around to our landing. You see his oars are gone. But—" and he hesitated.

"But what?"

"I'd have to leave you here with him while I run up to the cabin."

It was a brave, resolute face that the little girl turned toward her brother's anxious eyes. "I'll stay with him, Will. You go and get the oars."

Will waited only long enough to kiss the brave young face of his sister, then he started away as fast as he could travel over the rocks.

The waves lapped the shore of the rocky nook where Lela sat. The sea birds flapped their wings dismally over her head, uttering wild cries which, added to the deep roaring of the ocean, seemed to invest the place with a thousand nameless terrors. Lela noticed that the man in the boat was about forty years old, and possessed of a handsome, winning face. His dress bespoke him to be a man in wealthy circumstances. She had a vague idea that she had surely seen the man somewhere. She was vainly puzzling herself to decide where when Will came hurrying back with the oars. After considerable vigorous wrenching, the young egg-gatherers succeeded in loosening the boat, which they entered.

Will succeeded in getting safely out of the cove, after which it was comparatively easy rowing. As they drew near the landing they could see, in the full moonlight now silvering sea and shore, that a boat had reached there before them.

"It's father!" cried Lela, her tones full of subdued joy. Mr. Watkins hurried forward to meet his children at the landing.

"Oh, father!" shouted the boy, "it's a wounded man we found in this boat in the little cove below Pilot Rock."

"Who is he?" asked the astonished father, helping Lela ashore while Will steadied the boat.

"We don't know, father," she answered.

When Mr. Watkins and Will had carried the man from the boat to a place on the shore, they were surprised to see him open his eyes and try to sit up. Mr. Watkins had been staring at the man in a strange, incredulous manner, and now, catching the stranger's eyes fixed upon him in turn, he started back with the exclamation: "Theo Burris!"

"Jack Watkins!" came the almost inarticulate response from the other's lips.

Will and Lela stood by, silently regarding the two men. It needed no one to tell them that the man who had so wronged their father in the Little Tiger mine had, by some strange circumstances, been drifted to their lone island.

"Father," Lela suddenly said, "you must take him up to the cabin."

"Give that viper shelter!" fairly hissed Mr. Watkins. "What do we owe him?"

"Kindness, father. He is our neighbor. We can help him. I found him. You must help care for him, father," said his little daughter, earnestly, pressing his arm.

"Never!" and he strode away toward the cabin.

However, he did not go far. Lela's words rang in his ears, and he turned back. "Theo Burris," he said, addressing the man, "you wronged me; you wronged the very children who found and brought you here. But I will not taunt you now. I'll try to push the past out of memory and treat you as well as I can."

Without another word, and with Will's help, Theo Burris was carried to the cabin of the man whom his wrong had isolated. Two days later, thanks to the careful nursing which he had received, he was able to leave his bed. They then learned how he had met with an adventure which had so nearly proved fatal to him.

While out in his pleasure boat, he had been attacked by two coarse fellows in a yawl, who had robbed and left him, bleeding and senseless, at the mercy of the waves. Providence had directed the waves which had drifted the boat containing his almost lifeless body far out to sea, and at last safe into the little cove of the island. The gentle services of a little child helped to carry forward the Divine plan, and caused the one to decide to turn from the error of his ways and make full restitution for the wrong done, while she influenced the other to be merciful and forgiving toward the repentant man.

A World's Fair Garden Patch.

GEORGE E. NEWELL.

Sammy Burt's parents were quite poor, owing to his father's ill health, and they lived on a few acres of land in the hilly but beautiful county of Otsego, in New York State.

Sammy, who was twelve years old, was of much assistance to his father out of school hours, in helping him to cultivate their small farm. He was a very dutiful and obedient boy, and having seen more of "hard times" than most country bred boys of his age see, it had made him of serious and thoughtful demeanor. Sammy was an unusually bright scholar, and a great reader of books of foreign travel, and when the World's Fair began to be talked so much about, a year or so ago, a strong yearning arose in his heart to see its wonders.

One of his youthful aspirations had been to emulate Bayard Taylor's example and travel through foreign countries in early life, as that noted man had done. But a visit to the coming Exposition at Chicago would be almost equal to a trip around the world, and not cost one-hundredth part as much. But how was he to go? Sammy pondered over the subject awhile, and finally took it to his mother in confidence.

Mrs. Burt was very proud of her manly boy, and loved him as dearly as a mother can, but when he told her of his great desires, she shook her head sadly. "I am so sorry for you, Sammy," she said, "but it can't be, for you know your father only makes both ends meet now, and so I can't give you the slightest hope." But Sammy had a scheme, which he had been mentally revolving for some time, and he now proceeded to unfold it to his mother. If his father would let him have the use of a half-acre tract of land he would raise enough garden vegetables on it during the summer to pay his way to the fair by the middle of the autumn. He could sell the vegetables in the neighboring village, he knew. Mrs. Burt was rather dubious about the success of the plan, but she talked with Mr. Burt about it, and it was finally agreed that Sammy should have the privilege of trying to execute his scheme.

It was then in the spring of 1893, and as soon as the winter's snow had melted from the hills, and the ground became mellow and warm, Sammy, with his father's assistance, plowed the proposed truck patch, and prepared it for cultivation.

How busy the next few weeks were to Sammy in planting hills of early potatoes, sweet corn, beans, squashes, cucumbers, melons, and sowing peas, radish and beet seed. Then, along in June, "red root" and "pig weed" seemed determined to choke out his radishes, peas and beans, while cut-worms and striped bugs laid low the young squash and cucumber plants. Then the drouth came on, and for awhile the prospect of success for Sammy's enterprise hung in the balance. As is nearly always the case where many different vegetables are planted together by an inexperienced grower, some do much better than others. So it was in Sammy's patch. His early potatoes, sweet corn and melons were superb, while some of the other truck was indifferent in quality and yield.

Every one in the neighborhood had learned about the enterprise that was being conducted on the Burt premises, and great interest was felt in its success. Sammy's schoolmates were frequent visitors, "coming over to see how the World's Fair garden patch was getting along," and a melon was never stolen from Sammy's vines.

By the last of September the young gardener had collected enough money from the sale of his produce to defray the expenses of a trip to the great fair. The happy day was approaching when he was to start for Chicago in company with Mr. H., a friend of the family, who was going from the neighborhood, and who had promised to "see to the boy." The night before his departure Sammy repaired to his little room over the kitchen to dream of the White City and its many wonders. But excitement drove sleep from his eyelids, and he could hear his parents' voices in earnest conversation in the next room. They thought that he was slumbering, no doubt, but he being wide awake could not help but hear the subject they were discussing. It was of Mr. Burt's infirmity, an injury to the spine that he had received some years previously, and which had been the cause of his subsequent ill health. He had not been as well of late, although he had sought to conceal that fact from his boy, fearing that it would mar the pleasure of his long anticipated trip. This Sammy learned from their talk. He also learned that Mr. Burt's physician had advised his going to a New York hospital to receive treatment. "But you know I cannot go," said Mr. Burt to his wife.

"How much did the doctor say that it would cost?" asked Mrs. Burt, tremulously. Then his father named a sum that nearly equaled in amount the little roll of greenbacks that was stuffed in the boy's wallet.

Sammy's eyes were now more wide open than before, and he lay awake long after his parents slept. He was not thinking about the fair, either.

In the morning a very resolute looking boy came down stairs to breakfast, dressed in every-day attire. "Why, Sammy, why have'nt you got on your good suit of clothes, ready to start with Mr. H. for Chicago?" his mother exclaimed.

"I have concluded not to go to the fair, mother," said Sammy. "Father must go to the hospital."

All the persuasive powers of his parents could not change Sammy's determination, so with tears of thankfulness for such a noble boy, they submitted to his desires. That morning Mr. Burt took the train for New York with the World's Fair garden patch wallet in his pocket, and Sammy did not go to Chicago.

Protoplasm.

S. M. FARNUM.

What is life? The most that wise men can tell us is that the origin of life is in something which they call by the queer name of protoplasm. If you have a microscope, put under it a drop of water from some pond, and look among the tiny beings with which it swarms for a little speck of jelly nearly round. If you watch it patiently you will see it slowly change its shape; now it is three-cornered; now it is covered with little knobs; now it seems to be of no shape at all. This is a living, feeding creature. It is what scientific men call a simple life cell. Our bodies are built up of countless numbers of just such cells. They are working all the time,—growing, dividing, twisting, turning and weaving themselves into graceful shapes. Upon these motions depends the life of our bodies. Learned men call the matter of which these cells are composed, protoplasm.

When you cut your finger, a crowd of little cells go to work at once to repair the rent in skin and muscle. In a little while these tiny toilers have covered the wound with a colorless glue, and under this they make a new layer of skin. If for any reason these cells are not able to heal a wound, there is left a running sore of dead cells.

These busy workers know no rest. They are working to make your body grow, to heal injuries, to repair waste. Each set of cells has its own work to do. Some are making skin, some hair, some toe and finger nails, some muscles, some bones. They are not only workers but soldiers, fighting continually to defend you from the attacks of invisible enemies—that is, invisible except by the help of the microscope.

In the air, in the soil, in the water, in and on living bodies, are multitudes of minute beings called microbes. Very few of them are hurtful, but some of them cause disease. When our bodies are attacked by armies of those bacteria which are our deadly foes, then the little cells in our bodies act as soldiers and fight to protect us. Just think

of the battles fought for you that you know nothing about, to defend you from unseen dangers!

The wonderful substance called by that odd-sounding name, protoplasm, builds your bodies, gives them life, works for you, fights for you. It builds, works, fights, unseen and unheard. But marvelous as are its doings, it is only one of God's wonderful workers. Truly "He moves in a mysterious way, his wonders to perform."

At Grandpa's.

ELEANOR ROOT.

What could be more delightful than that old farmhouse among the hills! And when Christmas came, and Thanksgiving, and Grandpa's birthday, how it towered up as we reached the top of the long hill and gazed across at the other hill on which it rested—so big and white to our excited, childish eyes!

We could hardly wait to get there. We loved to hear the sound of the horses' hoofs as they clattered over that last, long bridge just before we drove through the rows of maples that led us straight up to Grandpa's door. And then, what greetings, and how the big fireplace roared and crackled, as if to add its quota to the general warmth and cordiality! The older ones gathered around the fire and talked of the last "Reunion" and how well Grandpa looked—"sixty-five and not a wrinkle," I whispered proudly to my mother—or spoke softly of the absent one, Aunt Dora, who so long ago had married against Grandpa's wishes, and gone far away to her Western home.

As they talked how quietly we crept out: and then what a whoop and halloo as we started on a race for the barn! George gets there first, and little Katie brings up the rear, blowing on her chubby red fingers and declaring that she is not "one bit" cold.

How we tug at the iron hasp, and what treasures are disclosed as the big doors swing open! "Onery, orey, ikory, Ann; Philisy, pholosy, Nicholas, John; queevy, quavy, English navy; stinklum, stanklum, buck! You're it!" then with a scramble and a dash we all but the unfortunate "it," who firmly closes his eyes, prepare to disappear.

Up into the haymow, under the machinery, behind the big posts, we ensconse ourselves and wait breathlessly. He is coming! My heart beats violently. I am almost suffocated under a huge pile of straw, and think, "What if he was an Indian and would push a pitchfork right down to see if anybody was here."

With merry shrieks and laughter the game goes on until some one suggests that it is time for dinner. Why, yes, how hungry we are to be sure; we can hardly wait! and, hastily brushing the hayseed from our clothes and hair, we start for the house.

But the evening was the best, when we all gathered around Grandpa and listened to stories of "Early days"; and how he killed a bear right over by the clump of cottonwood trees; and how he used to spank our mothers when they were naughty. That was the very best of all. Just think, our mothers, that we always thought were *born* good!

Then we had apples and cider, and the biggest grandchild always lit the candle and went down cellar to help get them.

What a time seeing which was the biggest! Grandpa measured us as we stood in a row, heads up, shoulders back. I was tallest and Frank was next—or was it Jack? "He's standing on tiptoe," some one cries, and, the fact being proven, Frank is ignominiously expelled from the row.

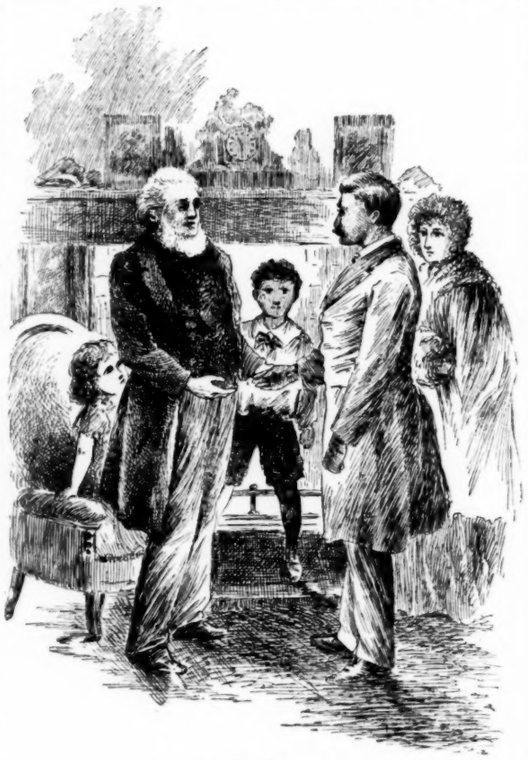
What fun to light the candle with one of those dear, little curly tapers from the cornucopia in the corner! How I wished that we had candles, and tapers, and cornucopias and things at home. And how good the tallow candle smelt as it sputtered and burned. I never smell one now but I think of apples and cider and the old farmhouse; of Grandpa and the dear cousins; of high posted bedsteads and valances and warming pans.

But what could equal Grandpa's cellar? There were separate rooms for all the different kinds of apples—red, yellow, brown and striped. And what rolls and pats of butter, and shining pans of milk, and barrels upon barrels of cider. Grandpa always put mustard and cinnamon in his cider to keep it sweet.

And when the happy evening was far spent, and little eyes began to look uncertain, and little heads to droop, Grandpa got out the big Bible and read. Then the bedroom candles were lit and we went through the long, cold hall covered with oil-cloth, and finally into the big, low rooms with those wonderful old beds—all posts and knobs and ropes and curtains and feathers. And when the warming-pan was passed to and fro, again and again, and we sank down into billows of warmth, it was bliss indeed.

The Southside Botany Club.

There were just fifteen pupils in the Southside ungraded school. The teacher, Miss Harris, was a bright young woman, enthusiastic in her work and in full sympathy with each member of her little flock. She had introduced many improvements. Her first step was to "talk" the committee into replacing the old wooden seats and desks with those of later date.



AT GRANDPA'S.

Over her bold innovations, some "who felt it in their pockets," were inclined to grumble. Why couldn't their children be satisfied with what was good enough for anybody forty years ago? Miss Harris had been obliged to use all her tact and to tax her argumentative powers to the utmost with these people, but she usually came off triumphant to her own delight and that of her pupils.

"I declare, it does seem kind o' good to see that air flag a flyin' an' a flappin' all so gay over the old schoolhouse," said Farmer Haton. "I druv round that way a purpose to see it. I paid out my money for it and I want to git the full ben'fit on't."

This spring the teacher and the older boys and girls had formed a botany club. They took many rambles over the surrounding country, and returned laden with many wonderful specimens which were duly examined and placed in old newspapers to press. Any member of the school was allowed to accompany the club on their excursions, and in this way the younger scholars had learned much by keeping their eyes and ears open.

Many and various were the ways in which different individuals had distinguished themselves. Jennie Taylor had found a white lady's slipper; Lina Hadley had discovered in an old swamp a patch of wild callas; Jack Haton had the best collection of specimens; Willie Steinway and little Jimmy Haton had each discovered a flower rare in that vicinity; Lucy Thomas had made the best set of drawings; Fanny Martin had poisoned her face twice and was still wondering where grew the bush that had poisoned her; Nancy Hemming lost her way in the woods one day, and was finally rescued by hearing a cow-bell and following the cow when it went home at night.

In a school like this one would not look for much distinction as to classes of society. Still it is a fact that Lucy Thomas, the doctor's daughter, rather looked down upon the others, and nearly all the others felt a little above Lina Hadley, the poorest girl in school. Lina lived in a miserable old house half going to ruin. Her father was one of the shiftless class. Lina was a smart, bright girl, and a favorite of the teacher's, which fact made Lucy secretly jealous.

Lucy, though good enough at heart, was something of a tease. One morning she had been teasing Jimmy Haton by keeping his ball from him. The little fellow finally became angry and said, "I'll pay you back for this now, you see if I don't!" She laughed, tossed the ball over the fence and said, "Take your old ball." She did not notice the determined flash of his eye as he climbed the fence, and would have thought little of it had she done so.

One day, toward the middle of the term, Lucy brought to school a large, illustrated textbook on botany. It was a new one, a present from her father, and she exhibited it triumphantly. It was indeed one of the best works to be had, and valuable to any student. Lina looked on admiringly with the others. How she longed for one like it! She had been saving all her pennies a long time to buy a botany, and when she asked the price of this, found she had nearly enough.

Just before recess on Monday morning Lucy looked in her own desk, then suddenly glanced up with a surprised air, looked in her desk again and began pulling out its contents. With a flushed face she replaced them. At recess she went to the teacher and said, "I cannot find my botany, and I know I left it in my desk last Friday night." The teacher went to Lucy's desk and looked, but the book was not there.

When school began Miss Harris requested all to look in their desks, and see if Lucy's botany was to be found, but it was not. Lina felt obliged to say something. She rose, holding a book and remarked, "I have a botany like Lucy's, but it is my own. I bought it Saturday."

"Doubtless Lucy's will be found," said the teacher, and the morning lessons went on again.

At noon there was another general search. By and by it was given up. Lucy was confident that she had left the book in her desk.

While Lina was eating her dinner the others began to group around Lucy. Finally they went out and had a long consultation. When they came in, one or two went up to Lina in a conscious way, and asked to see her new book. She laid it on her desk. As they all gathered round, Lina turned a little pale, for she noticed that something unusual, mysterious was in the air, and she felt that she was the cause. As she saw their meaning looks, to one another, ill concealed, she flushed crimson.

In the afternoon recess they shunned her. Little groups gathered in earnest conversation and she saw them sometimes look over at her. After school they took the teacher into consultation.

At the next afternoon recess Lina came toward one group, but it seemed to melt away before she reached it. She was a brave, strong girl, but she could not endure this state of things much longer. She waited after school to see the teacher.

Miss Harris came up to her and said gently, "Well, Lina, what can I do for you?"

Lina burst into tears. "O, why do they treat me so? I know what they think; they think that I have Lucy's book. But, Miss Harris, honest and truly, it is my own. Even if we *are* poor, we are honest. I saved up my money and rode to the city with Mr. Hemming last Saturday and bought the book. You can ask him if I didn't."

The teacher, putting her arm around Lina, said

comforting words. "My dear child, this will all come out right in time and they will be sorry. But I think it best to say nothing about it for a little while."

Lina looked up gratefully through her tears. "O, thank you, thank you! I am so glad that *you* trust me."

"Indeed I do, Lina," said Miss Harris, softly.

The next morning, to the surprise of all, Lucy found her book back in her desk. What had happened to it? That was the all-absorbing topic for the day. Many of the pupils looked in a sheepish way at Lina, and awkwardly tried to get into her favor again.

That afternoon the teacher asked them all to wait a little after school. Then she said,

"It seems to me that some one in school must know something of this proceeding. You have all had a good lesson of one kind, and now I am not sorry that this has happened. Remember how you have made Lina feel. If any one does know anything about this, will not that one be manly or womanly enough to tell us all?"

At that, what was their astonishment to see little Jimmy Haton rise, quaking, to his feet. He looked about in a frightened way a moment, then burst out, "I hid it in the stove!" and ran out of the room as fast as his little short legs could carry him.

It was over like a flash. When the door closed behind him there was silence a moment, then a giggle was heard. The teacher smiled, and thus encouraged there was a general laugh.

When they were still again, Miss Harris remarked: "I think there is no more to be said. You are excused."

Lucy and Lina waited behind. When the rest were gone, Lucy went up to Lina and said, "But there *is* some more to be said. I have treated you outrageously and made the others do the same. I wonder if you are willing to be friends with me?"

"Perhaps I should have done the same if I had been in your place," was all Lina said, as she took the offered hand.

Then Lucy went up to the teacher. "I hope you will not blame Jimmy too much, for I provoked him, and I think he feels badly enough about it. How he did scamper, though!" and at the recollection the three laughed heartily.

The next morning Lina, Lucy and Miss Harris each found two large "Bellflowers" in each of their desks. They knew that no one but Mr. Haton had kept those apples so late in the season. "Have a bite?" said Lucy to Jimmy at recess, offering him the rosy-cheeked Bellflower, and there was such a look in her eyes that he took a good, friendly one.

A Good Sleeper.

H. D. TAYLOR.

One summer I took a trip from New Bedford to Portland in a coasting schooner, with one of the best captains who ever sailed the seas over. We left port about 10 o'clock Tuesday forenoon, with a light wind, and were only off Minot's Ledge light Friday night, when the wind died out entirely. After eating supper the captain looked over the water awhile and said:

"No wind to-night, boys. I guess I'll turn in early," and he went down into the cabin. When he came on deck in the morning he again looked at the weather, and prophesied no wind until after noon, then he ate his breakfast and again went below, and in a few minutes was sound asleep. At dinner time he came up again, and, after a hearty meal, went back to his bunk. He was on hand for supper, and remained awake for nearly an hour, when he again turned in, and slept until morning. The next day he did the same thing, and he kept it up for five days, as long as the calm weather lasted.

I knew captains were good sleepers, but I never heard of one sleeping like that, so I asked the mate, Mr. Robinson, how it was that Captain Brown could sleep so much, and if he always slept like that when on the water.

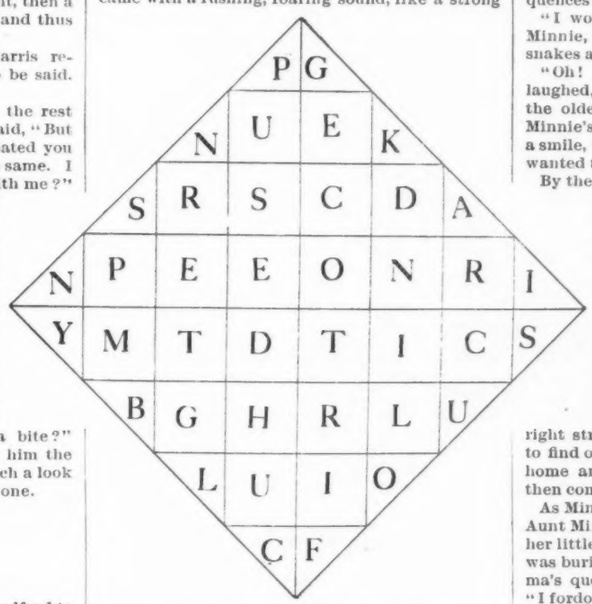
"No, Captain Brown is not a lazy man. But he is just laying up sleep against the time he may need it. When he has nothing to do, like the last week, for instance, he will sleep most of the time. But only the last trip up here we had a gale of wind that blew us way out of our course, and Captain Brown never left the deck only long enough to get a bite of something to eat for seventy hours. Then we got our reckoning, and he took a nap for an hour, after which he was on deck for forty-eight hours more before he slept again. I wish I could lay up sleep like that, and then keep up the way he does, but I can't do it."

I could not doubt Mr. Robinson's story, and on the trip back I had a chance to see it proved to some extent. We had quite a blow, and the captain was as wide awake as any man I ever saw. He never left anything for any one else to see to that ought to be done by himself. Just as soon as the weather grew calmer, however, he would take his naps as often as he had a chance.

A Locust Storm.

When Mr. Darwin traveled in Chili he was fortunate enough to witness what the natives call a "locust storm."

He says that at first there appeared, just above the southern horizon, a dark and slightly reddish cloud, with a ragged edge. At first it seemed to be such a cloud as may be made by the smoke of some very large fire, in which spices or tobacco may be burning, so dense was it, and yet with such a red glow showing through the darkness. But it became rapidly larger and denser, approaching with great swiftness. Then the strangers thought it must be a storm cloud, especially as it came with a rushing, roaring sound, like a strong wind against the sails and through the cordage of a ship at sea.



SHAKESPEAREAN PUZZLE DIAGRAM.

But the strange cloud came nearer, and it was found to be an immense swarm of locusts on its way northward. The swarm passed over the heads of the travelers at a height of about twenty feet from the ground and seemed to rise to the height of between three thousand and four thousand feet. The noise was made by the rapid and continuous movement of such a vast number of wings. Looking upwards from below them the sky could be seen through the advance guard, although it was darkened so that it looked like the lighter tones of a mezzotint engraving, but after the mass became densest no sky could be seen through it.

Our State Names.

Nevada comes from the glorious snow-capped mountain range, the Sierra Nevada; and Vermont from its Green Mountains—the *Verts Monts*. Maine is a new world souvenir of an old world French province of the same name.

New Hampshire was originally Laconia, but received its present title from J. Mason, a governor of the English Hampshire, to whom it was conceded in 1629. In the same way little New Jersey was so called in honor of Sir. G. Carteret, who defended Jersey against the parliamentary forces in 1664; while New York, formerly the New Netherlands, is so known because it was once granted to the Duke of York, who was afterward James II.

OUR LITTLE FOLKS.

How Minnie "Fordot."

"Girls, which of you want to run up to Aunt Minnie's to borrow her chopping knife?" inquired Mrs. Foster. "I am going to make some mincemeat, and I can chop it in half the time with two knives."

"Let me do this time, Mamma?" pleaded little Minnie, Aunt Minnie's namesake. "I haben't seen Aunt Minnie for eber and eber so long, and I know she wants to see me."

"Oh! you're too small," interrupted Clara. "You'd forget to come back, and Mamma wants it right away. Shall I go, Mamma?"

"I think I had better go," spoke up Bessie (who, being almost a young lady, scorned to ask permission). "I want to see Auntie about my new dress, and I can kill two birds with one stone." But as Bessie rose to leave the room little Minnie pulled her mother's skirt while she begged, "Please let me, Mamma?"

Brother Hal, who had just come in, laughed as he caught her up in his arms. "It would never do for an infant like you to be carrying edged tools through the street. Why, you might commit a murder or suicide." He sat her down on the floor while he illustrated the natural consequences of such an act in the proper manner.

"I wouldn't either, you horrid boy," replied Minnie, indignantly. "I don't murder bugs and snakes as you do; and I neber saw a suzincide."

"Oh! ho! ho!" laughed Hal, and the girls laughed, too; but Mrs. Foster did not approve of the older children teasing the little ones, and Minnie's flashing eyes were soon accompanied by a smile, when Mamma bade her get her hat if she wanted to go.

By the time she was ready to start she had forgotten Hal's teasing and almost everything else, excepting that she was going up to Aunt Minnie's and that her errand had something to do with mincemeat.

She walked away very fast up the hill and was soon opening the door at her Aunt's, but, alas! for the little memory she had left! There sat a strange lady talking to Auntie, and by the time she had been properly introduced and kissed even the mincemeat had vanished from her mind, though she dimly remembered that Mamma had said "come right straight back." Aunt Minnie tried in vain to find out her errand, and finally told her to run home and ask Mamma what she wanted, and then come back again.

As Minnie closed the door behind her she heard Aunt Minnie and the strange lady laughing, and her little feet never stopped until her curly head was buried in Mamma's lap, where, to all of Mamma's questions, her only answer was a sob, and "I fordot."

"I ought to have given her a note or told her the last thing before she started, she is so little," said Mamma to Bessie, who put on her hat and went for the knife.

Minnie never really forgave the strange lady for laughing at her, though she and Aunt Minnie soon made up and were as good friends as ever.

Our Puzzler's Corner.

For this month we have given you a Shakespearean puzzle in the form of a diamond. Find as many of the characters in this diagram as you can by taking the letters in the squares adjoining each other, either at the top, bottom, sides or angles. No letter can be used twice in succession, but if another letter is used between, it will be allowed again in the same word. That is, you cannot form a double letter unless the two letters are given in squares adjoining. Besides giving the characters, tell what plays they figure in. For the longest list we will give a nice nickeled watch valued at $4, a telescope valued at $3, a year's subscription to the AMERICAN AGRICULTURIST, a Columbian souvenir spoon, and a pocket-knife.

THE PRIZE WINNERS FOR NOVEMBER.

First prize, H. B. Jordan, New York; 2nd, Justin E. Day, New York; 3rd, Mrs. A. R. Tirrell, Massachusetts; 4th, Marie Heckencath, New York; 5th, Sallie E. Sawtelle, Missouri.

THE ANSWERS TO THE NOVEMBER PUZZLE.

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    T   U T   P E D
  T U M I D E M I T
    T I G A D I M
      D A V I T
    D I D I B I S
  D I V O T I C A L
    D O W   S A G
      T       L
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Wheat Farms in the Northwest.

Spring wheat raising in North Dakota is a fascinating business in ordinary seasons; but when the price is as low as it has been during the present season, the outcome is not pleasant, to say the least.

The first step in prairie farming is to break the sod about three inches deep, at any time after the grass is well started until the first of July. A breaking outfit consists usually of three horses or mules and a sixteen-inch sulky plow, or else four of them on a gang of two twelve, or fourteen-inch plows. A day's work is from two and a half to five acres, depending on the character of the soil, the team, and the weather. After the grass roots are rotted the sod is backset; that is, plowed back, with a couple of inches of the subsoil turned on top of the breaking. Then it is harrowed in the fall or spring, or both. Stubble ground is rarely harrowed at all, as on wet land it will not dry out quickly enough in the spring, and on dry land it is inclined to drift where it is cropped year after year, although I believe that if the dry land is harrowed in the fall, it packs and does not dry out as early in the spring, thus giving the grain a better start. Seeding is commenced as soon as the frost is out of the ground four or five inches, which is usually about April 10th to 15th. Shoe drills are used with a chain coverer for wet land, and a press wheel for the drier land. The drills are from eight to twelve feet in width, and are drawn by four to six horses abreast. From thirty-two to forty quarts of seed is sown to the acre.

The grain is cut during August and September, with self-binding harvesters, drawn by three horses, and cutting thirteen to sixteen acres a day. It requires about two pounds of twine to the acre for an ordinary crop. With ten days of good weather after the grain is cut, it is ready to be thrashed, which is done direct from the shock. The help necessary to thrash fifteen hundred to two thousand bushels per day is an engineer, a fireman, a water hauler and team, two feeders, two band cutters, five pitchers in the field, two extra pitchers at the machine, one man and team to back the straw away from the machine—which is done with a heavy pole, by hitching a horse at each end of it—and eight teams to haul the bundles to the machine. Straw is used for fuel. The machine has an elevator on the side that raises the grain and lets it run down a long spout into the wagons, which have large, tight boxes, holding about seventy-five bushels for a two-horse wagon, and 120 to 140 for a four-horse one.

The elevators have platform scales, with an arrangement for tipping up the front end of the wagons and letting the wheat run out of the hind end into the pit, so as to avoid handling the grain, which those of us that have hauled wheat in sacks thoroughly appreciate. The cost of raising an acre of wheat here after the first crop, which is more expensive, and hiring everything done in good shape, without counting rent, is: Plowing, $1.50; seed, 70 cents; drilling, 50 cents; cutting, twine and shocking, $1.00; thrashing fifteen bushels at 10 cents, $1.50; hauling fifteen bushels three miles, 30 cents; making a total of $5.50.

T. F. EASTGATE, Grand Forks Co., N. D.

An Arkansas Traveler.

On a recent journey from Southern Kansas through the Indian Territory to Fort Smith, Arkansas, the prevailing crop noticed was winter wheat, which was very luxuriant. The land is a beautiful rolling prairie, and the further south the larger the streams and more abundant the timber. The ranges of hills near the Arkansas line are clothed with forests to their tops. Fort Smith is the gateway to the Indian Territory, and is a city of some 15,000 inhabitants, situated on the Arkansas river. It is surrounded by a good farming country. Cotton, corn and fruits are the principal crops. Extensive mines of coal are located fifteen miles south, at Jenny Lind, where from twelve to fourteen hundred tons a day are taken out, and five hundred men are employed. Fort Smith is the principal town west and north of Little Rock. Van Buren is a stirring town on the Little Rock river. It is a shipping point for fruits, particularly strawberries. Carloads are shipped from here north to Kansas, Nebraska and Colorado. It is a grand country for early vegetables, especially sweet potatoes. There are very extensive coal mines at Coal Hill, where I noted long trains of cars loaded ready for shipment.

The forests have but little underbrush, and the trees are not very close together, with more or less grass between, which make a beautiful picture. There are thousands of acres of this fine timber awaiting capital to manufacture it into every thing needful in the wood line. It is said there are fifty kinds of timber in this valley of the Arkansas and the mountains—oaks of several kinds, hickory, walnut, gums, yellow pine, poplar and cypress. Much cotton is raised, though one sees numerous fields of corn, with stalks from ten to twelve feet high, and in fair seasons on the bottoms it yields from sixty to eighty bushels to the acre. The soil is mostly of a red color, which is unsurpassed for fruit. Grapes grow wild and vines of great size festoon the forests and yield a profusion of fruit, that is as large as many tame varieties. Apples reach perfection in the northern part of the State and in Johnson county, of which Clarkesville is the county seat. The abundance of iron in the soil gives them extra size, color and flavor. Peaches, pears, plums, grapes, figs, persimmons and berries do remarkably well.

F. C. JOHNSON, Pulaski Co., Ark.

After the Fair.

The great Columbian Exposition is over, and we can settle down once more to our normal level. I am prouder than ever before of our fair Dominion, and especially of our own beautiful, fertile Ontario. Our ice palaces at Montreal, and our toboggan slides and snowshoeing parties, so much illustrated and scattered over the civilized world, led very many to suppose that Canada was one perpetual winter, and that toboggans, snowshoes, sleighs and furs were our chief products. Well, this great fair has given us a chance to set ourselves right before the world, and thousands gazed in unfeigned astonishment at our luscious fruits, ourchoice grains, our rich minerals, our live stock, our cheese, and especially Jumbo, the twenty-two thousand-pound cheese, the largest ever made. Why, we carried back so many prizes into this Ontario of ours, we can hardly refrain from throwing our caps in the air, boy-fashion, and shouting Hurrah! every time we think of our conquests in the White City.

Our crops for the past season average well, in some lines a trifle light, caused by a drouth just at ripening. Last autumn has been a remarkably fine season, one of the best we have ever known, sunny days and blue skies, which would vie with far-famed Italy in that respect. It was just a trifle too dry for fall wheat. Now winter is upon us, a snowy mantle covers all this country, in the midst of which I write—frosty, and occasionally the thermometer has no mercury above the zero line. A glorious prospect seems open to us as a nation whose dominion extends, as spoken of in Scripture, "from sea to sea, and from the rivers unto the ends of the earth." Peace and prosperity reigns within our borders.

REV. JOHN MORRISON, Ontario, Canada.

Lessons from the Great Drouth in Europe.

The recent drouth in Europe, which was more keenly felt on the continent than in England, has had the effect of instigating researches which cannot fail to be invaluable in the recurrence of such a direful calamity. The sufferings have been especially appalling in France, Germany and Switzerland. On the continent the governments are much more prone to render aid under such circumstances than in England. In France the public exchequer was relieved of one million dollars in aid of farmers who were in the deepest distress, while in Switzerland the relief partook of government interference with railway and other corporations, rather than through direct grants from the government.

The main line of inquiry has been in relation to substitutes for the different kinds of fodders which the drouth had rendered scarce. While practical farmers were turning their attention to agricultural plants grown in other countries, which possessed the property of flourishing under adverse circumstances, chemists were employed in determining the nutritive values and digestive properties of fodders which had hitherto been little known. The leaves of different species of trees formed one of the main sources of inquiry. The leaves of the poplar have been highly recommended, two-thirds of a pound of the air-dried material equaling in nutritive value one pound of average hay, and the digestive co-efficient of the leaf and the hay is substantially identical. The green leaves, gathered in August and September, may be dried or ensiled. The farmers in the mountains of Tyrol and Salzburg gather every season the leaves of the maple and the oak. These trees, also the hazelnut, are cultivated principally for fodder, and the leaves fed to cattle, sheep and goats, the quantities gathered depending upon the scarcity or abundance of other fodder crops. The maples and oaks grown in the fields are merely stripped of their leaves, the branches being spared, while in the forests the branches are cut off, and the stripping operations performed at home. Leaf gathering is mainly regarded as child's play, the children being expert tree climbers. The leaves are first left to wither in the shade, then they are taken home to be dried on the barn floor, and are afterwards preserved in an airy place. On a more extensive scale in unusually dry seasons, the work is performed mostly by adults, the branches being cut off and made into bundles. Under such circumstances, the leaves of the beech, the alder, the birch and the willow are also utilized as fodder. It is estimated that a hectare of land (two and one-half acres) will produce 26,400 pounds of green leaves, equaling 11,000 pounds of hay.

W. A. MACDONALD, England.

The Winter's Outlook in Michigan.

After an autumn of unparalleled mildness, our winter set in with equal rigor. While rarely do we have real winter weather much before New Years, December 1st found the ground covered with snow in sufficient quantity for sleighing, which continued for several weeks with very little intermission. The yield of grain last season was small, many farms not producing enough for their live stock, to say nothing of any to sell. On some farms not enough corn was raised to fatten the hogs for market, yet there seemed to be no shortage in hogs, as about the usual number has been marketed. They were nearly all pigs of one hundred to one hundred and fifty pounds weight. Comparatively few old hogs are kept for fattening nowadays. Best results are secured by bringing the pigs to about one hundred and fifty pounds dressed weight and then selling them. This gives quick returns on the money invested, and is much more desirable than longer feeding. Everything farmers have to sell this winter brings low prices. It takes a good deal to bring a little money. Taxes, too, are higher than usual, and this adds to the despondency. Farmers, however, are much better off than many others. Trade of all kinds is dull. Our merchants are complaining that they sell much less than usual, and all because the farmers are not getting the money they ought to receive for their produce. It has been many years since Michigan farmers have received such small compensation for their summer's work as the present one, and this owing to no fault of theirs. Freshets in the spring, and drouth in the summer, have combined to bring about disastrous results.

E. E. ROCKWOOD, Genesee Co., Mich.

Farms and Farming in Bulgaria.

Could the Western farmer be suddenly transferred from America to Bulgaria, without the intervening gradual changes which come by the way in traveling, he would note at once the strong contrasts everywhere prominent—nowhere more so than in the farms and farming—and be intensely amused and interested thereby. The country itself is laid out attractively, giving widely extended and remarkably detailed views of its farm lands. Ranges of mountains rise very abruptly to the height of nine thousand feet, while between them are broad plains as level as a house floor, divided into tillage and pasturage without any boundary lines,—not a fence disfigures the landscape or bristles with the barbed proclamation: This is mine and that is yours.

The cultivated lands resemble a patchwork quilt, or to a less prosaic mind suggest the artistic design of mosaic work. Here is a square or oblong piece of newly plowed land, next to that a field of ripening grain; beyond that a patch of

rich, waving green; another of more tender and velvety shade denotes a less advanced stage; then sections of vegetables add their variety. In crossing the mountains, one may stand at the summit of some especially favorable outlooking point, and command a whole plain, twenty or thirty miles across to the next range of mountains, and as far to right and left, counting thirty, forty or fifty villages, the rusty red of the tile roofs half concealed by the abundant fruit trees growing in nearly every yard. Among these hamlets is one settlement larger and in every way different from the rest, in fact quite European in appearance, with its spires and towers gleaming white and fresh in the sunlight and this clear atmosphere, which matches the Italian air so much lauded.

These farmers do not live each upon his own section of land, but the villages of the plains are theirs, and the larger and finer ones are the shire-towns or markets and seats of government for the groups. A distant and elevated view of Bulgarian farm life is certainly picturesque and pleasing, but for details one must descend from the height and go into the midst of operations. There the charm is at once dispelled, or at least gives place for the time to mixed feelings of disgust and pity for the methods and implements employed. Indeed it is a marvel how the land is induced by such processes to yield even meager harvests, for plowing, sowing, reaping and garnering are all done in the most primitive manner imaginable.

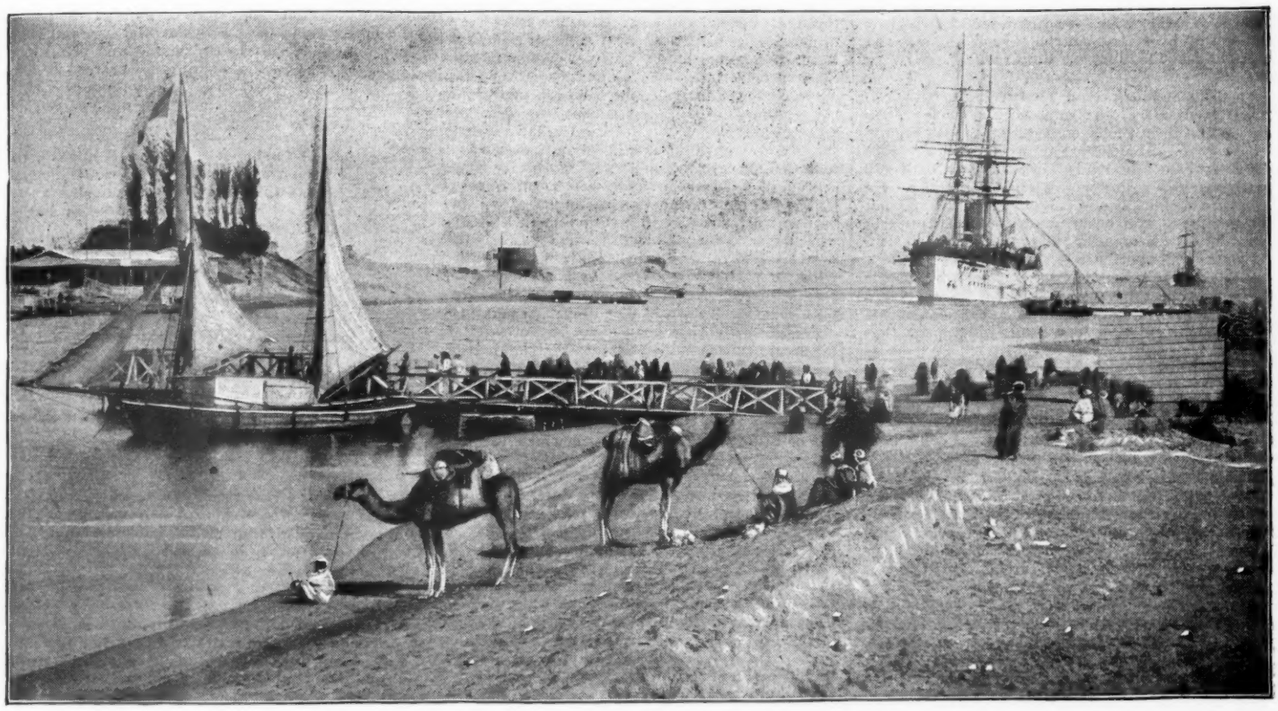
The plow is simply a piece of wood, a crooked stick, with a short prong faced with iron somewhat like an arrow-head, which answers the purpose of a plowshare, and a long prong which serves as a handle. Oxen or buffaloes drag this queer instrument over the ground, opening up the soil to such a shallow depth as would disgust the most shiftless farmer in the United States. The harrow is equally a makeshift, and other instruments correspond. The hayfork is a stick with three prongs, two long ones in the position of tines, and a third shorter one opposite them. Grass is cut by hand, a straight snath and a short, broad and straight scythe being used. When the mower wishes to whet his scythe he lays it upon one stone and hammers the edge with another stone. Then the hay is all stacked on the field to wait until the official examiner can estimate its value and the taxes upon it. This may occupy weeks or even months, and afterward the owner may haul his hay into the barn or to market. In stacking, two poles are laid parallel upon the ground beside a haycock, the hay piled upon them in fitting quantity, then, by a man at each end, the poles are carefully raised and the hay carried to the stack.

S. E. GRAVES, Shumla, Bulgaria.

The Suez Canal.

Formerly Africa was joined to Asia by the Isthmus of Suez, a little more than seventy-two miles wide at its narrowest part, but for the last twenty-five years Africa has been an island rather than a peninsula, by reason of the Suez canal from Port Said on the Mediterranean to Suez on the Red Sea. The canal is one hundred miles long. The depth is twenty-six feet, the width at the bottom is seventy-two feet, while at the surface of the water the width varies from 195 to 325 feet. The country through which the canal passes is a sandy desert, barren and uninhabited, except where it has been made fertile by irrigation. There are a few ridges from twenty to sixty-five feet above sea level, but the average altitude is from five to eight feet. The few depressions and salt marshes, formerly below sea level, have become lakes by seepage from the canal. The surface soil is mostly sand and gravel, underlaid with sandstone, limestone, and a fossiliferous conglomerate. The canal changed the climate, making it cooler in summer and warmer in winter. The Israelites crossed the Red Sea a few miles below the head of the gulf of Suez on their exodus from Egypt. [Our illustration, engraved from a photograph, shows a reach of the canal in its wider part. A band of Moslem pilgrims are embarking on the sloop for Mecca in Arabia. The large vessel is a British troop ship carrying soldiers to India. In the distance is seen a Royal mail steamer going to Australia.]

H. S. RENTON, Port Said, Egypt.



THE SUEZ CANAL, SHOWING EMBARKATION OF PILGRIMS TO MECCA.

Horticulture in Texas.

Perhaps no other State in the Union has such a variety of rich soils and offers such good opportunities to the horticulturist and farmer as Texas. The fruit of the tropics grows to perfection on the coast. The soil of the coast is very well suited to the pear. In Northern, as well as Southern Texas, it is raised to perfection. The varieties that are most successful are the Kieffer, which grows well in all parts of the South, the Duchess, Bartlett, La Conte, Garber, Early Harvest and Howell. The Texas State Horticultural Society, which meets annually, ranks with any of the older societies of other States. Its fairs are noted for exhibitions of fruits of all kinds, including those of the tropics. The papers, essays and addresses made at each annual meeting of the society, in regard to horticulture and its kindred sciences, are of the best, and by men that are noted and make a study of their specialty. W. L. MOORE, Denton Co., Texas.

Pecans and Persimmons in Iowa.

In a recent issue of the AMERICAN AGRICULTURIST I noticed an item on "Pecans in New England." As I am a native of Hartford Co., Conn., I thought my experience and observation here in about the same latitude would be of some interest to Mr. Bucks, to whom you directed your communication. The pecan is native to our woods on the river banks and islands in this vicinity. Although not common, a few years ago there was one some two feet in diameter standing at the mouth of Rock river. Just where the Hennepin canal empties into the Mississippi river, some twelve or fifteen years ago I set out a number of seedlings about a foot high. Most of them lived, and some are fifteen feet high. No nuts so far. My friends in Upper Mississippi, who planted them years ago, say it takes fifteen years to come into bearing; probably it will take longer in this climate. At the same time I set out five seedling persimmons, two survived. They are now about the same size as the pecans, and have borne fruit for two years. I protected them for a few years. The fruit is delicious after a few hard frosts. I see no reason why both pecans and persimmons could not be raised in Connecticut—set out in protected situations and protected for the first few years. We have colder winters—nothing uncommon for the mercury to stand at 20° below zero. I also at the same time tried the pawpaw; but one has survived, with no fruit. Years ago I set out several white and black birch. They do well, but no seedlings have come from their abundant fruit. I planted that pest of New England, the daisy or white weed, and it takes constant coaxing to get it to bloom, so I stand in no fear of being indicted for bringing it here. I have been a constant subscriber to the AMERICAN AGRICULTURIST for twenty years, or more, and admire it as much as ever.

E. S. BALLORD, Scott Co., Iowa.

First-Class In Every Respect.—I am very much pleased with the AMERICAN AGRICULTURIST both as to its subject matter and its mechanical execution. I consider it first-class in every respect.

A. R. WELCHMAN, Winter Co., Ky.

The Spring Campaign.—D. Stambaugh, Iron Co., Mich.: All the necessary tools, harness and farm equipment should be in perfect working order, and such repairs as might possibly be needed in the spring should be made. Time is too precious to be spent in hunting up whiffletrees, clevises, chains and buckles, or in polishing plowshares and sharpening harrow teeth when the opportunity to sow spring crops is at hand. Do not allow yourself to be caught unprepared. Every good general holds a force in reserve. After you have determined on the quantity of land you will sow to oats, spring wheat or barley, it is a good idea to decide in your mind what you will do with it in case a wet spring prevents you from sowing these grains in good season. What will it pay you to do with it? Sow it to millet, buckwheat, or sweet corn for autumn feed, or to grow some crop on it that can be turned under in the form of green manure for winter wheat.

Seeding Meadows and Pastures.—F. G. Morrison, Christian Co., Ill.: In sowing grass seed, one of the first things to be considered is to determine whether the old meadows or pastures need reseeding, and also how many acres of new land you will seed down, and whether clear timothy or a mixture of timothy and clover is best, and in what proportions. The best time to sow this seed in your locality is another important consideration. If your own experience is not a sufficient guide it would be advisable to consult a neighbor who is known to be uniformly successful in securing a "catch." If you have to purchase the seed now is the time to do it. Very often it happens that much better seed can be bought from a neighboring farmer than at the store, and at a much lower price. Do not wait until sowing time comes before securing the seed.

Egg-Bound Poultry.—A. H. Keane, Queen's Road, Eng., writes us: The frequent recurrence of death to good layers is an accident, the reason of which often remains a sealed book to the amateur. Such deaths are common to Minorcas, Spanish, Leghorns, and other breeds laying large eggs—the cause being inability to lay an abnormally large egg. After a few days of dumpishness the hen is found dead and thrown away. These are causes of death from egg binding. To prevent similar losses it will be well to note the following: If a hen visits the nest again and again, and lets her wings droop and appears distressed, immediate help is what she must have or else she will die. Catch her and dose her with a dessertspoonful of linseed oil, which is to be repeated once an hour till the desired result has been obtained. Immersing the vent in warm water is also often successful, but care must be taken not to break the egg in the hen's body.

Osier Willows in Europe.—N. Jarchow, Westchester Co., N. Y. writes us: In Europe the planting of osier willows is done both in fall and spring. To obtain good plants for the holt a nursery is required in which the acorns are sown, during the fall, in well prepared seedbeds in rows fifteen inches apart. The rows are opened with the hoe and the acorns are laid two inches deep so thickly as nearly to touch each other, and covered with soil. The beds are then covered with dry leaves held down with brushwood to prevent uncovering by winds. When spring opens the leaf cover is removed and piled up alongside the beds. After the plants have made their appearance the ground should be thoroughly cleaned and raked, whereupon the remnants of the leaves are scattered between the rows, to serve as a mulch for preventing the growth of weeds. When the plants have reached the age of from two to three years they are transplanted in the nursery and kept there from two to three years longer. They are then ready for the oak grove. If the ground is not grassy nor apt to become weedy, the four to six-years old trees are taken up in the nursery, the shoots so shortened that no more than two buds remain above the root crowns, the taproots reduced to an average length of from six to eight inches, without disturbing the little rootlets adhering to the remaining part of the taproot, and then, protected against sun and wind, planted out if possible on a rainy day. Such stump-plants will sprout soon and grow up freely. But on places where grasses spring up easily the stump-plants would soon be overgrown and killed. In such grounds the plants taken from the nursery are shortened only by half of the stem length, or not shortened at all. The latter will not grow as vigorously as the shortened, but will give some material for tan bark. The profitableness of raising young oaks only for their bark has led many owners of oak forests in Europe to converting them into oak holts for tan bark. This operation presents more difficulties.

Cleaning Seed Oats.—Fred Grundy, Christian Co., Ill., writes us: The land intended for oats should be selected and the seed cleaned and in readiness. Many farmers never clean seed oats. They say that oats are oats, and take their seed out of the bin, heavy and light, good and bad, all mixed together. If there is any advantage to be gained by planting good seed corn, or plump, sound wheat—and no farmer denies this—then there certainly must be in sowing the best of oats. Run the seed oats through a good fanning mill this spring and see if it does not make a marked difference in the yield and quality of the crop. All know how very fickle the early spring weather is, and that we can count on but very few days at a time in which any farm work can be done, therefore everything should be in perfect readiness to make a dash when the opportunity is presented. I have many times seen a difference in yield of twenty bushels and over per acre in two fields of oats sown two weeks apart. The first were put in at just the right time to get the benefit of a warm rain, or to mature just before a hot wind, or a shower followed by a scorching sun struck them. And where grass seed was sown with the oats I have seen a few days make the difference between a good catch and a complete failure. In nine cases out of ten the earliest spring-sown oats are the surest to yield a good crop and return most profit.

Keeping Meat Fresh in Winter.—C. Y. Ulster, Jackson Co., Mich.: In sections where the temperature remains below the freezing point for weeks at a time, beef and other freshly-killed meat may be kept in a fresh state for several weeks by hanging up in the loft of the wood house or other building in which no fire is kept. To make it readily available, the meat should be cut up in slices or in pieces suitable for cooking, if intended for boiling or roasting. It may then be hung up in a basket out of the reach of cats and dogs. Chickens may be thus kept, but should have the offal removed, and will prove convenient for company, or those calling unexpectedly. If the pieces are rubbed with fine salt when first cut up they will keep in a better condition. The salt may be partly removed by soaking in warm water before cooking.

In Praise of the Paragon Chestnuts.—J. S. Woodward, Niagara Co., N. Y., writes us: "In the spring of 1890 I planted three very small trees in open places in a natural chestnut grove, where they have never had any care since beyond a severe letting alone. Two lived, but have never made much growth; yet the past summer one bore three burrs and the other seven. Each burr contained three nuts, and the nuts averaged as large as four common sweet chestnuts. I tested them and gave others to test in comparison with the native nut, and no one called them inferior. Some thought them sweeter and more tender than the common kind. This little tree, that bore the seven burrs and twenty-one nuts, is but seven feet high and the body only three-fourths inch in diameter, and had I not staked it up it would have been unable to hold up its load, and would have lain prone on the ground. It bore what was equivalent to forty-two common chestnuts, which was more than any native tree four inches in diameter in this grove ever produced in one year. I showed some of them to a dealer here, and at the time common chestnuts were selling for five dollars per bushel, but he said he would be glad to get a lot such as these at eight dollars. Last spring I grafted a lot of small native trees with the Paragon and the cions made a growth from two to five feet in length. I measured one cion which, in all its branches, made over twenty-five feet of new wood. Some of the cions blossomed, even though just set this year. I am more than pleased with the Paragon, and shall continue to graft until I have changed my whole grove. From present experience I believe there is more money in an acre of chestnut grove than in two acres of the best apple orchard."

Salting Butter in the Churn.—W. S. Weir, Vernon Co., Wis.: There has always been a great objection in the market to streaked or mottled butter. Consumers will not buy it, though it is hard to give a reason for this objection. It is only of late years that dairymen have come to agree that this mottled appearance is caused by an uneven distribution of salt in the butter. To prevent this the usual plan is to work in the salt and then set the butter aside to cool and harden and let the salt all dissolve, then rework the butter until all is of an even color. All dairymen know how difficult it is to do this reworking without injuring the grain. The new way to avoid this trouble is to salt in the churn and not work the butter at all. The churn is stopped when the granules form, and the butter washed with water at sixty degrees Fahrenheit until it runs off clear. Then water at fifty-five degrees is added, and when the butter cools to this degree add one and one-half ounces of salt to the pound and mix thoroughly in the churn, then take the butter out and gently press it until dry. A little practice will make this easy, though you may not succeed at first, but skill will finally result.

Bisulfide of Carbon.—J. M. M.: Bisulphide of carbon is often used to smother rats and mice as well as insects infesting stored grain, but to be available it must be used in pits, holes or rooms where the air and fumes can be confined until the animals and insects are smothered. When used in bins containing bran, ground feed or grain, it is not necessary to sprinkle the liquid upon the grain, but merely to put it into small, wide-mouth bottles or jars and set these on the feed or grain, then as the fumes escape they will settle down among it, as they are slightly heavier than the air. Of course the bins must be closed up tightly for a few hours or days, and then when opened and the bisulfide botties removed the air will soon dispel the fumes. To hasten this, stir up the grain or feed with a shovel until it again becomes odorless or nearly so, but have the doors open then.

Support for Sweet Peas.—Jacob Miesz., Charleston Co., S. C.: The best support for sweet peas is common wire netting, which can be fastened to stakes firmly set six feet apart. In light soil plant six inches deep, in heavy soil four.

Starting Dahlias.—A. C. Ely, Fairfax Co., Va.: Dahlia roots should be started in damp moss, sawdust or sand, by covering and placing them in some warm situation, about one month before it is time to plant them out. By that time the eyes will be well started, then cut the tubers so that there will be but a single eye to a piece. Should any more appear after planting out, remove them, and never allow but a single stalk in one place.

Sports in Plants.—P. C. Peters, Queens Co., N. Y.: Not unfrequently the same variety will "sport" in the same manner in various localities, the same season. As an instance of this, the Crawford half-dwarf celery, in two different localities, the same summer produced almost pure white leaves, and was self-blanching. This freak was immediately christened the White Plume celery, and from seed this "sport" remains constant the same season. The variety known as the "Sandringham" sported in Europe in precisely the same way, and it was there called the Golden self-blanching celery. The Catharine Mermet rose, in two different greenhouses, the same season threw up shoots from its roots that bore pure white flowers, and the variety was christened "The Bride."

Canning Vegetables and Fruit.—W. W. Meeker, Harford Co., Md.: In canning some of the staple vegetables and fruits, a very long process is required, or a very high degree of heat is used for a shorter time. Corn, beans and peas need a process of three or four hours. Tomatoes are successfully canned by a process of boiling for a quarter of an hour. The shortest process that will succeed with anything is most desirable, and this is to be ascertained by experimenting with

each variety. The various fruits are now generally preserved by being cooked and filled into tin cans or glass jars, and hermetically sealed while hot. They may be cooked in the cans and jars, and then sealed. Giving them the needful process in the cans, avoids the danger of breaking the fruit in filling. In some of the canning factories, where tin cans are used almost exclusively, air and gases liberated by heat are allowed to escape by puncturing the cans in the midst of the process. In such cases the puncture is closed by solder as soon as the escaping steam will permit it.

The Potato Once More.—Subscriber, Monroe Co., N. Y.: If the correspondents of some of our contemporaries will persist in making such assertions as the one to which you call our attention we cannot help it, viz: "As is well known, Sir Walter Raleigh found the potato in Virginia and took specimens back to England." We do wish, however, that those who make such statements would read the life of Raleigh, or the brief sketches given of his career in the standard cyclopedias, if for no other purpose than to learn that he never was in Virginia or elsewhere in North America.

Spring Lambs.—Wm. Pettit, York Co., Penn.: With a small flock of sheep to insure a return from spring lambs, you must take the trouble to prepare a protected shed, or other well ventilated pen in which the ewes are to drop their lambs. You should inspect the flock not less than twice a day to look after the weak lambs and get them on their feet. These lambs must be pushed from the start by feeding, and also by taking extra care of the mothers, to realize the great difference in price between early and late lambs.

Size of Dairy Cows.—A. L. Harding, Greene Co., Penn.: In selecting a good dairy cow, there are more important items to be taken into account than that of size. This, however, is one of the controlling factors when judged from a purely commercial standpoint of profit. The practical dairyman takes little account of the beef value of an animal that has to be carried so many years. He demands his dividends once a year, and to make them as large as possible he cuts down expenses to the lowest practical point. To do this he must not carry a machine that is too large for the labor to be performed. It has been quite clearly proven that a given number of pounds of carcass divided among small animals will make greater profit for milk production than when those pounds are contained in a less number of cows. To use extreme instances, the elephant could never be made as profitable a milk producer as the goat—there is too much waste material to carry. The exact size of a cow at which the greatest profit can be produced has not been determined, but the Columbian dairy tests at Chicago indicate that it lies somewhere between six hundred and a thousand pounds.

Preservation of Food.—L. T. Hart, Fairfax Co., Va.: Drying food products may be successfully done by the heat of the sun, or by applying hot air in or out of a vacuum. The temperature should be under 140° F., as a higher degree of heat will make the substance hard and insipid. The drying process is often preceded by salting a little, or smoking, or both, as with fish, beef and pork. Jerking meat is drying it in thin slices and then bruising it in a mortar. This method is much used in regions where the air is exceedingly dry. Dried fruit should be pressed together so as to exclude moisture from the air. For use on vessels making long voyages, both fruits and vegetables should be hermetically sealed. When soaked in water, they are ready for use. They are of great value to both sailors and soldiers in preserving them from scurvy. Fruits intended for flavoring purposes are put up without sugar. For eating they are best canned with sufficient sugar to suit the taste. All acid fruits are best when cooked soft before the sugar is added; and after its addition they should be cooked long enough to make it permeate them thoroughly.

Cows for the Dairy.—Col. L. S. Hardin, Ky., writes us: In a series of years the loss by death, injury or becoming worn out of cows in the dairy will be, on an average, about ten per cent. of the whole number in the herd. To supply this yearly loss the new cows must be obtained either by purchase, or by raising heifers, or both. Which is the most profitable must be determined by each one according to his surroundings. Dairymen usually raise a few calves from their best cows, and generally by any bull that is convenient. This is often poor policy. It certainly costs more to raise a heifer in a dairy than the same heifer could be bought from a farm. Having an ill-favored sire keeps her from being any more valuable than other heifers. If you have a good lot of heifers to pick from, and good judgment is used in making selections, this is the best way to keep up the herd, for a better proportion of good cows can be secured this way than by either purchasing mature cows, or raising your own heifers even with a good bull. The old cows are usually culls, while you must raise three or four heifers before you get one good, profitable cow.

Cottonseed Hulls, or Malt Sprouts.—W. F. Erb, Lincoln Co., Ky., can buy clover hay for $12 per ton, cottonseed hulls at $7, and malt sprouts at $12, and wishes to know if it will pay to buy cottonseed hulls to feed with the malt sprouts. Chemically speaking, these three feeds are quite similar, and one would not help the other in making up a ration for cows, if that is the use to which the feed is to be put. We would advise that you stop feeding the malt sprouts at $12, and buy cottonseed hulls at $7, adding to the latter some corn meal mixed with corn fodder run through a cutting box. Clover hay is always a good feed for cows, provided it is cured in the best condition, and not handled enough to shake the leaves off. There is often more to be said about the condition in which you find a certain kind of feed than in its chemical parts. The first thing is to see that it is in good condition, and then notice how the cows like it, and what effect it has on their milk yield. We would not waste much time on these hulls and sprouts, if good corn meal and wheat bran are to be had cheaply. Cows must have rich feed and plenty of it to make much milk.

Damp Cellar Floors.—G. T. Smith, Orleans Co., N. Y.: To rid a cellar of moisture, dig a channel about one foot wide and six inches deep through the wet portion, leading it into a drain or outlet; fill this with coarse gravel to the very top, pounding it firmly in place; this will carry off all the ground water before it reaches the surface. The drain under the wall may have become filled up and allow the water soaking into the soil outside to find its way through the wall to the cellar bottom, in which case dig a shallow channel along the wall in the bottom and fill it with gravel or finely broken stone.

A Blanket of Snow.—S. L. Price, Middlesex Co., Conn.: A covering of snow will prove a great protection to meadow land and to fall sown wheat and rye. It should be induced to remain as long as possible, not only on the crops named, but over strawberry plants and about the trunks of trees, currants, raspberries and shrubs. It should not be allowed to accumulate to a sufficient depth to press the canes and stalks to the ground, as they are often injured by the heavy packed drifts. Snow thrown up around the foundation walls of the dwelling house will prove a great protection to the contents of the cellar, and frequently save them from disastrous freezing. To retain snow upon fields swept by winds, brush scattered over them will produce the result. Even cornstalks scattered about will accomplish the same end.

Clipping Horses.—J. Stithton, Hardin Co., Ky: The horse is the only animal that sweats all over on ordinary occasions. This sweating is quite debilitating to him. The managers of race horses reduce them quite rapidly in flesh by sweating them. To prevent horses from becoming wet in cold weather and catching cold from sweating under their heavy coats of hair, it is advised that they be clipped all over. This is said to be equal in economy to a pound of grain a day, by making the horse that much more comfortable, provided he wears a blanket out of doors when standing still, or when it is cold and stormy.

Tame Rabbits.—L. T. Davenport, Worcester Co., Mass.: Occasionally people get the rabbit fever from reading some newspaper article, and knowing their very prolific nature, think all that is required will be to obtain several pairs, and in a few months market the surplus. But in actual practice it will not prove so fascinating and remunerative as expected. While around the general farm buildings they are able to glean a living, yet during winter or when vegetation is poor they are liable to strip the bark from fruit trees and shrubs. In a few days' time they may do more damage than twenty dozen of them would realize in the market. As pets, one or two will be of no particular detriment, and when they have served usefulness in this line they may be killed for the market. When they are to be raised in quantities a proper enclosure should be built for them and they should be kept within its boundaries. For this purpose a wire netting similar to that used for poultry yards will prove best. It need be only about half the usual height for poultry, or about four feet.

White Flakes in Butter.—Mrs. J. Stewart Athens Co., Ohio: It is very well settled now that the white flakes that are so annoying to the good housewife when they appear in the butter, are due to one of two causes, or perhaps both. If the milk is set in shallow pans and, by leaving a window or door open, a current of air is allowed to pass over the surface of the cream as it rises, certain parts of it are dried, and form these white flakes. Then again, if the cream can is allowed to get too warm, the acid formed will turn little particles of milk to curds, which appear in the butter as white spots.

Carding Cows.—H. Stock, Riley Co., Kan., writes: It seldom pays to card cows. Labor must be very cheap about the farm when a man can profitably spend many hours a day on the herd working with a card. In the first place, cows that are giving milk are usually so thin in flesh that the ordinary farm hand would inflict more harm than good upon them with the sharp teeth of a card. There are rubber and hair brushes or pieces of burlap that are good enough to rub the dust off of cows. Carding, however, is a refinement of treatment that is hardly necessary with cows that are otherwise well cared for. The man who can make it pay, or even avoid a loss, by carding cows needs no advice about managing a herd.

Unprofitable Dairy Herds.—M. York, Orange Co., N. Y.: It is the fashion to take a "cow census" of certain counties in a dairy district, and from the poor showing made out by these voluntary census takers make it appear that a very large proportion of the dairies are actually run at a loss to their owners. Somehow these owners have been living on their farms for many years and carrying on the same business, with the same so-called losses; and, while they have no other capital, still retain or buy their farms. How is this loss computed? Sometimes the dairyman is charged with the price the feed fed to the cows would sell for on the farm. They did not realize that much cost with the herd. Every farmer who throws all the produce of his farm on the market not only robs the farm, but he lowers the market by crowding it. In other words, there must be so many stock farms to keep up the price of farm produce. The manufacturer says it does not pay him unless he gets ten per cent. profit; the real estate dealer is content with four per cent.; and the farmer who first takes his living out and has all over that, is usually content with the profit. He certainly is not working at a loss.

Fancy Game for City Markets.—Geo. E. Walsh, Queens Co., N. Y., writes: On marshy farms frogs may be made a source of income, for the hind legs of the large kinds are considered popular delicacies in the cities. Trouts are raised in the wells and ponds on some farms, and they prove very lucrative live stock. A good fish pond can be constructed in many parts of the country with comparatively little outlay, and if the right kinds of fish are raised in it, some money can be made. The ponds also serve as excellent duck ponds, and fish-raising and duck breeding seem to go together. In the West several farmers have added rabbits to their live stock, and in Idaho and Colorado hunting them proves so successful that rabbits add very materially to the income. Several attempts have been made to raise buffaloes on large stock ranges, but so far only ordinary success has been attained. This work is most praiseworthy; for, unless farmers can raise these animals on stock ranges, the whole family will soon be exterminated. Altogether there are about one thousand head of buffalo that live in captivity, and these will probably soon constitute all that remains of the once numerous American bison

SCIENCE IN FARMING.

Forests and Rainfall.—The weather observations at the Maine station, for four years, are reported by R. H. Fernald (R. '92) as showing that from April to October the excess of moisture in the forest above that of the open field in the morning, amounts to only six per cent., while in the middle of the day it rises to fourteen per cent., and at nightfall drops down to ten per cent., the mean excess of moisture for the day being ten per cent. In a very dense forest the percentage of excess would undoubtedly rise much higher. The presence of patches of forest in any region must thus exert a marked influence on the water vapor in the atmosphere, and this condition, in turn, is an important factor in the growth of vegetation. T. J. Burrill of the Illinois station, reports (B. 26) that there is not the slightest doubt that the climate is affected by forests. The temperature is equalized; the extremes of heat and cold are not so great. The moisture of the soil is better distributed through the year. The running streams are better sustained and also less subject to destructive floods, where the country is well timbered, than where the land is kept bare by cultivation, and the surface so drained that the water runs away at once. Heavy winds are greatly checked, much to the comfort of man and other animals. Crops are preserved in various ways from the destructive influence of air moving too rapidly. Trees for the ornamentation of the home area, as well as for the wide expanse of the country itself, can never be neglected by a people whose cultured tastes and educated perceptions pleasure in the beautiful and picturesque.

Southern Strawberries.—At the Virginia station spring-set strawberry plants have done best according to W. B. Alwood (B. 27). Fall-set plants bore very little the first year, and when permitted to fruit, the plants were so weakened that a good stand was not secured for the succeeding crop. If the blossoms are removed the first spring, an enormous growth of plants is secured for an excellent crop the second spring, eighteen months from planting. Summer planting did not succeed on account of the almost certain drouths in late summer. With good culture, plants set in the spring will fill up the rows, and give an excellent crop the second spring. The blossom buds should be removed when the plants are set out. The land should be very carefully worked prior to setting. Most commercial growers would do better to reset every year. Growers for home use may get a fairly good crop of fruit from the same plants for two or three years. Mulch should not be put on the plants until freezing weather has checked growth. The coast region truckers desire an early, firm berry of good color, and this they secure in such varieties as Hoffman and Westbrook. These do well for Northern shipments, but for fruit for the home table, Haverland, Beder Wood, and Parker Earle are preferable. Michel's Early is decidedly the choice for a strictly early crop. For a home garden a good selection is: Haverland, Beder Wood, and Parker Earle, all quite hardy and furnishing fruit the whole season. These, with Great Pacific, Shuster's Gem and Warfield, furnish a list from which commercial growers can realize the best results. Gandy and Summit are the best very late sorts, but useful only for the home garden.

Changes of Food and Weather in the Dairy.—A chemical examination of the milk of forty-five cows, of grade and pure blood of different breeds, owned and cared for by different farmers, is reported by C. L. Ingersoll and H. B. Duncanson of the Nebraska station (B. 30) as showing during thirty days, that changes of food changed the quality of the milk. A ration of poor quality showed loss in per cent. of milk fat present, and one of rich, nutritious food caused increase in per cent. of fat. The final result shown was that there was little change produced in the total fat day by day, but that the changes in per cent. of fat were fully compensated in changes in the milk yield of the cows. The use of the Babcock test for milk fat was so nearly accurate in the work required that the chemical analyses for butter fat showed no appreciable difference. The use of a group of cows, fed without change of food, as a check on possible variations was very apparent, as without such a check the variations might be attributed to the change of food when really the latter had nothing to do with it. The cows had good, warm stables, and were as comfortable as possible in a place where no artificial heat was to be had. The study of the sudden storms and cold waves included ten observations. Of these seven showed a diminished yield of milk, and in three the yield was constant. The milk fat diminished in per cent. in five observations, remained constant in four, and increased in one observation. These variations occured in cows as they were actually found on a series of farms in close proximity. They show very clearly that even in barns, secure from wind and storms, the dairy cow is very susceptible to cold and dampness in the atmosphere, and that she consumes a portion of the butter and other constituents of the milk in striving to keep warm. It evidently pays well to shelter and make very comfortable the cow giving milk.

Electricity for Plants.—Experiments in electro-culture with the alternating current from the dynamo at the electric light station have been tried at the Massachusetts station, and are reported by C. D. Warner (H. B. 23) as showing that when subjected to electrical influences, some varieties of seeds germinate more quickly, and certain plants blossom sooner. Some kinds of vegetables have a tendency to enlarge their roots while others grow a large amount of tops. Tomatoes ripened sooner, and plants standing near the electrodes developed a larger growth of roots and foliage. The vegetables experimented with—parsnip, lettuce, carrot, turnip, beet, salsify, radish and onion,—were not in any way injured by a current of thirty-nine amperes with a voltage of fifty-three, but generally were stimulated in growth. Growing vegetables by electricity can hardly be considered practical. Some method of collecting and using atmospheric electricity might be employed with a possibility of the farmer being well paid by an increased growth of cereals and some varieties of vegetables, but when batteries and dynamos are employed, the cost of instruments, wires, increased amount of labor, resulting from a network of lines, in addition to the expense of generating the electricity used, would render the undertaking too expensive for the practical farmer. The increase in yield of crops would scarcely pay for the trouble and outlay, though it is very apparent that electricity does to a certain degree influence the growth and development of plants.

Cottonseed for Fattening Steers.—Some method of preparation by which cottonseed can be most successfully used a feed stuff has long been desired. The practice of feeding boiled cottonseed to both dairy and beef cattle has long been in vogue, but the feeding of roasted cottonseed is of much more recent date. Feeding experiments at the Texas station by G. W. Curtis are reported by J. H. Connell and J. W. Carson (B. 27) as proving that roasted cottonseed does not have the laxative properties of the raw seed, and is more palatable, but the advantages to be gained by the use of roasted seed scarcely justifies its general use as faster gains were made by the boiled seed, though at a greater cost per pound of gain. Boiled seed being more palatable than raw seed, less laxative and making faster gains, may continue to be used with profit. Steers fed on raw seed ate a less quantity of it, and used slightly more hay in consequence. Cottonseed at usual prices is a good and cheap addition to a corn and hay ration, though at $10 per ton for raw cottonseed, the cottonseed meal, hulls and silage is a good ration. The average cost of gain per hundred pounds in all the steers was $3.64. The cheapest feed per pound gained, for all the steers fed, was raw seed at $10 per ton, corn and hay, each one hundred pounds of gain costing $2.83.

The Winter-Killing of Trees and Shrubs.—Many trees and woody plants, hardy enough to withstand the low temperature to which they have been subjected, are killed during the winter. The causes of such winter-killing have been investigated by A. Nelson at the Wyoming station (B. 15) and at Harvard University. It appears very probable that dessication is the chief cause. The plants of the arid regions of high altitudes are subjected to many conditions which conspire against successful hibernation. The dry atmosphere, the usually gravelly soil, the great difference in temperature between the roots in the frozen soil and the branches in the intense sunlight, frequent dessicating winds and sudden changes of temperature, operate together to cause transpiration of moisture far in excess of the absorption by the roots, thus causing wilting, shriveling and death. The experiments proved that the rate of transpiration or evaporation is directly and proportionately increased by the diminution of the atmospheric pressure. Thus the moisture-drinking rarefied air of the high plateaus sweeps over the Great Plains as a blighting blizzard to vegetation. The remedy is to use all possible means to keep the plant, and especially the roots, in a fairly moist condition. Irrigate late in the fall and in the winter. Flow the water over the soil on the warmer days, filling the earth-cracks, and even forming an ice coat which will prevent the evaporation of the soil moisture. A liberal mulching with straw, leaves or coarse manure will be helpful. The most moisture and protection is needed during the first winter after transplanting. Tender shrubbery and small young trees may be protected by securely tying an abundance of straw, hay, or even paper, closely around the stems and branches, or by placing an open barrel or box around the stems and packing with hay or straw. Small trees and half-hardy plants may be covered with a mound of earth alone or over mulch.

Effect of Mulch on the Ripening of Fruit.—It is generally believed that a mulch or heavy cover placed upon the frozen soil around plants will retard flowering and the maturity of fruit, but the results are often unsatisfactory. Careful experiments upon the effect of mulches have been made at the New York Cornell University station, by L. H. Bailey (B. 59), which indicate that the early bloom of fruit plants depends very largely upon the appropriation of food stored in the twigs, and it is more or less independent of root action. This is proved both by direct experiment, and by study of the physiology of plants. It must follow then that the temperature of the twig or branch must be reduced if its vegetation is to be much retarded. The top of the plant, as well as the soil, must be mulched, and in practice this is possible only with strawberries, and other very low plants, or those which are laid down during the winter. There is danger of injuring plants by heavy mulch which is allowed to remain late in spring. If it is desired to retard flowers or fruit by mulching, the practice should not be violent and the plants should be carefully watched. Many strawberry growers are able, by mulching after hard freezing, to delay the ripening of that fruit from two days to two weeks, but a week's delay is usually about the limit of profitable results.

Testing Sugar-Beet Seed.—The Austrian seed-control station at Vienna is reported by T. R. Weinzierl (R. '92) as having established the following normal or standard for sugar-beet seed: The sample should not contain more than three per cent. of admixture of dirt or harmless weed seeds, nor more than fifteen per cent. of moisture. It should show in six days of the germination test, one hundred and twenty-five plants for each one hundred seed clusters, and not less than four-fifths of the seed clusters should have sprouted by that time. Each kilogram of seed should yield not less than seventy thousand plants, or thirty-one thousand eight hundred plants to the pound. During the year, the station inspected two thousand eight hundred and ninety samples of various seeds, and sealed and attested eight thousand and thirty bags of clover seed. There has been a gradual increase in the number of tests for which fees are paid, showing an increasing appreciation of the work of this seed-control station. Two-thirds of the tests for which fees were charged, were of samples of sugar-beet seed.

Winter Cauliflowers.—Experiments at the New York Cornell University station are reported by L. H. Bailey (B. 55), as showing that cauliflowers succeed well in a forcing house, if they are kept in a vigorous and uniform growth. They need a rich soil, careful attention to watering, cultivation and ventilation, and a cool temperature like that employed for lettuce. They appear to thrive better without bottom heat than with it. The Early Snowball and Erfurt strains force well. Plants should be set in the beds when from six weeks to three months old, according to the season of the year, and from four to five months elapse before the first heads are fit for market. The heads ordinarily require no bleaching, and they are ready for sale when from four to six inches in diameter, which is a convenient size.

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FARMING IN FOREIGN LANDS.

The cotton crop of India for 1893 was from thirteen to eighteen per cent. higher in the various provinces than that of the preceding year.

Cotton culture is rapidly increasing in Burmah, as is indicated by the amount of exports, which increased seven fold in the last fiscal year over those of the preceding year.

The large, white Yorkshire pig has become the favorite breed with Danish bacon factories, and large numbers of them are imported yearly from England for breeding purposes.

A mess pork factory has been established at Canterbury, New Zealand. The company buys the green pork from the farmers and cure it by the dry salting process for shipment to London.

The Babcock tester for determining the proportion of butter fats in milk, is very popular in Victoria, Australia, and its use seems likely to become general in the butter factories of that colony.

The pastoral industry of Argentina shows very slow increase. In 1874-5 the number of cattle killed in the saladeros was 1,542,000. The number last year was 2,009,000, and the preceding year 1,962,000.

Professor Nocard states that tuberculosis exists in chronic form among cattle in Brittany, Champagne, and, above all, in the Beauce. His observations do not sustain the theory that the disease is hereditary.

The Duke of York has become a tenant farmer on the estate of his father. The president of the Cheshire Agricultural Society humorously states that "the first thing the duke did was to ask for a reduction of rent."

The "royal lady farmer at Windsor," to wit: Her Majesty, the Queen, was a very successful exhibitor at the Birmingham fat stock show, winning no less than six prizes and a champion prize with animals bred on the royal farm.

Horses are very cheap in Australia. The horse markets are glutted with animals offered, for which there is no demand. Similar reports come from Great Britain. Indeed the depression in the prices of horses seems to be world wide.

The Agricultural Department of India has adopted what is there spoken of as "a new idea," and which consists in publishing for general distribution monographs, similar to the Farmers' Bulletins of the U. S. Department of Agriculture.

A fine stud of hackney horses has been established at Buda-Pesth, Hungary, by a wealthy gentleman named Wahrmann. Among the foundation animals are thirteen mares from the renowned Brookfield stud of Mr. Burdett Coutts.

Farmers in all the parts of Europe which suffered from drouth last year find it difficult to provide forage to keep their live stock through the winter. In France and Germany, twigs of trees and vine are made to contribute to the subsistence of cattle and sheep.

The farmers of Germany are uneasy at the prospect of new taxation made necessary by the increased public expenditure under the army bill. It is proposed to lay a tax upon all wines over 50 marks ($11.90) in value per hectoliter (26½ gallons), or about ten cents per quart.

U. S. Commercial Agent Smith reports that the Rhine vintage of 1893 was a full one-half crop. This is a gratifying amount, as a three-fourths vintage is a rarity and a full vintage remarkably scarce. It is expected on all sides that the Rhine wine of 1893 will be fine in quality.

South African papers announce that extensive deposits of nitrate have been found in the valley of the Orange river. The deposits are said to be from three to six feet in depth throughout a considerable extent of country, and that at least three million tons of nitrate may be obtained.

Comparative trials of sheep shearing by hand and by machine, made in Australia, resulted largely in favor of the machines. It was found that a thousand sheep could be sheared by machine for about ten dollars, and the yield of wool is about eight ounces per head more than when sheared by hand.

Coffee planting is being pushed in the British colonies of North Borneo and Central Africa. In the former Liberian, seeds and seedlings are distributed among the natives, who have each to plant fifty trees, selling the produce at a fixed rate to the government. From the Central African colonies it is reported that on some plantations coffee trees planted two years ago are now laden with a grand crop.

Orange growers of the Cape settlements of South Africa are beginning to cultivate the St. Michael orange, a small fruited variety, which is noted for "the delightful thinness of the internal 'rag,' the delicacy of the internal membrane dividing the sections, and the fewness and small size of the oil glands."

Notwithstanding the fostering care of the French government, sheep breeding has declined in Algeria, and official reports show that for several years past there has been a progressive decrease in the number of sheep. The present number is estimated at 8,896,000, the estimates being based on official figures.

The Chicago rule of dropping out of the premium list beeves over three years old was adopted at the recent fat stock show in Birmingham, England. A leading English paper says that "nothing was lost by the omission, while the profitable and practical character of the classes was unquestionably enhanced."

The government of South Australia some years ago caused its explorers to plant seeds of date palms at their camps. The palms from those seeds have grown to tall, productive trees; and well-matured dates have been received at Adelaide. The Queensland government is planting cocoanut palms on the islands along its coast.

Experiments in the fertilization of tobacco lands have been made in pursuance of plans adopted at a general convention of tobacco producers held at Carlsruhe in 1891. The results, so far, are not very definite, but in a general way they show that potash manures greatly improve the quality without greatly increasing the quantity of the leaf.

An English cheese maker, whose storage room became badly infected with blue mold (*Penicillium glaucum*), adopted as a disinfectant dilute boracic acid, with which he washed the walls, woodwork, utensils, and all parts of the cheese rooms. As the fungus reappeared in the cheese he repeated the disinfection twice a week, until all signs of the parasite disappeared.

During the last seven years the area devoted to indigo in India has been about 300,000 acres, but in 1891-2 it sunk nearly one-third. A favorable season and a rise in the price of indigo at Calcutta, led to a great extension of the industry in 1893, and the area of cultivation was estimated at 350,000 acres. The output was about eight per cent. above the average rail exports for the last twelve years.

At the latest hiring fairs held in various parts of England and Wales, engagements were made for the ensuing year at the following prices: Farm foremen, $90 to $120 per year; second hands, $80 to $90; plow boys, $50 to $65; lads, $30 to $50. Female farm servants were hired at annual wages ranging from $90 to $100 per year for head girls; $50 to $70 for kitchen maids; women able to attend the dairy $80 to $85.

New Zealand has twenty-five establishments in which mutton is frozen for the British market. The output is some two million fat sheep a year. The sheep used for this purpose are chiefly crosses of Merino and Down, long-wooled breeds. Shropshire Downs and Lincolns are in much favor for rich, level pastures, while in hilly and broken situations Border Leicesters have proved quite successful for crossing on Merino ewes.

Quack grass, which is regarded only as a troublesome weed in Europe and America, is highly esteemed in Australia. The *Australian Agriculturist* says of it: "It is a most valuable fodder, thrives on any soil, not easily affected by frost, and is the first to shoot out green in the spring. Cattle are very fond of it, the milk produced by it is of a good quality, and the butter and cheese manufactured from such milk is generally a first-class article."

Special efforts are being put forth by Australian vine growers to increase the manufacture of wine. Central presses are in course of establishment, and though the wines to be turned out—chiefly burgundies and clarets—will lack age, they are expected to find their way, in due time, into the markets of the world. There is a large stock of wine of mature age in numerous farmhouses, especially in New South Wales, which it is proposed to utilize for trial shipments. Experts who have professionally tasted samples from these private stores, are of opinion that they will admit of bulking, and so furnish a brand uniform in taste and flavor. Even, after all, should the newly-made wines fail to secure public favor, storing them for five years would be sufficient to attain the standard of flavor of the genuine clarets of Southern France and Italy.

The Industrial Association of Bengal has published a note on certain native fiber plants which may be made to furnish a cheap substitute for jute. All the plants enumerated belong to the mallows family. Among them are three species of Hibiscus, one of which *Hibiscus rosa sinensis*, is quite largely cultivated in America as a greenhouse and window plant. Another is the Potari (*Abutilon indicum*), which is closely allied to the velvet leaf so common as a weed in the Eastern United States.

Large quantities of tea plants and appliances for the manufacture of tea, together with Chinese laborers, are being transported from China with a view of establishing plantations in the Ural region of Southeastern Russia, which has been found very favorable to the growth of the tea plant. The Chinese trading classes do not favor the project, as they fear it will become, like tea culture in India and Ceylon, another serious rival to the native industry.

A permanent memorial is to be made of the famous herd of wild white cattle at Cadzow Forest, the property of the Duke of Hamilton. The Duke has given instructions to have presented to the Kelvingrove Museum, Glasgow, a collection of specimens representing the herd. These will consist of a stuffed bull, cow and calf, and the skeleton of another bull. The herd has recently been partly crossed with the equally famous wild cattle of Chillingham Park, and it is, therefore, likely that the pure Cadzow breed may not long be available for preservation.

The cultivation and manufacture of jute has grown to immense proportions in India. In 1883-4 the exports were 63,646,000 bags and 7,049,000 yards of cloth; in 1892 they were 123,975,000 bags and 40,060,000 yards of cloth. This does not, of course, represent the whole of the manufactured jute trade, for very large quantities of bags and cloth are shipped from Calcutta to other parts of India, and are used as coverings for raw produce and manufactured goods exported. There are twenty-five jute mills in Bengal, with 8,814 looms and 177,718 spindles. Over 66,000 persons were employed in these mills.

An Australian paper says that in the warm and dry regions of Victoria, where wheat growing is the staple industry, farmers are adopting a new course of cropping by alternating wheat with oats. The Algerian variety has been tried with success, even in the driest parts where it was formerly believed that oats would not succeed. This is, however, the same variety that has been pronounced unfit for feeding French army horses. It is claimed that oats yield a crop of equal value with wheat—the increased yield making up for the lower price per bushel—and that it leaves the ground in good condition for the ensuing crop.

The agricultural returns for Great Britain in the past year (says the *Scottish Farmer*) are now published, and afford striking evidence of the changed conditions under which farming is now prosecuted. No one required them to prove that wheat lands were going out of cultivation, but it is something to get the proof of this established by hard figures. Farmers are turning their attention more and more to barley and oats, and in both of these cereals there is an increase. The most striking fact, however, is that there is actually a decrease in the number of almost all classes of live stock—cattle, sheep and pigs showing a decided fall.

Aberdeen-Angus cattle were peculiarly successful in the show ring last year. At the Royal Jubilee Show at Aberdeen the champion prize was won by Prince Inca, bred by Sir George Macpherson Grant. At the show a few weeks later in Durham, the home of the Shorthorns, the champion honors were awarded to the Aberdeen-Angus bull Albion, bred and exhibited by Mr. Clement Stephenson, and nearly related to Abbess of Turlington, which carried off the female championship at Chicago. At the Birmingham fat stock show the same breeder won a fresh triumph, his A. A. cow, Bridesmaid of Benton, taking the champion prize. At Smithfield, the greatest show of all, the champion winner was the neat A. A. heifer, Pride of the Highlands, bred and owned by Mr. Fletcher.

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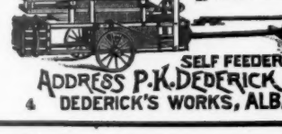

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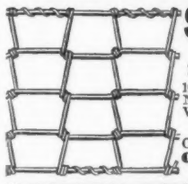

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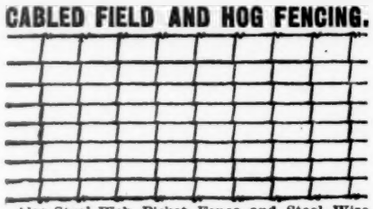

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THE INTERESTING FACTS REVEALED BY THE ELEVENTH CENSUS, HERE PUBLISHED FOR THE FIRST TIME.

One of the greatest industries on the farms of the United States is the dairy industry, and the life of the nation is probably more dependent on the cow than on any other one thing. The milk supply of our large cities is, in itself, a great industry, and the numerous railroads running out from every city are the means of solving this problem. Yet far greater is the dairy industry of the country at large, not only in the supply of milk for each dairyman and cow owner, but in the manufacture of butter and cheese.

The Census of 1890 was the only complete inquiry ever attempted. Every farmer, or other cow keeper, was required to state the total quantity of milk he produced in 1889, amount sold for consumption in families, amount sent to creamery or factory, quantity used on farm (including for butter and cheese), and amount of milk used on the farm in raising cream for sale. Relative to cream, enumerators were obliged to ascertain amount sent to creamery or factory, and disposed of in other ways; butter made on the farm and how much of it was sold, and the same for cheese. Only a few of the totals have yet been compiled by the Census Bureau, and the following tables contain a summary of this data as compiled by the AMERICAN AGRICULTURIST:

Section.	*Milch Cows.* (Last 000 omitted)			*Milk** (In millions of gals.)		
	1890	1880	1870	1890	1880	1870
N. Eng'd.	822	747	643	338.9	61.7	31.1
Middle ..	2,562	2,472	2,214	1,107.5	285.1	156.4
Southern.	4,167	3,400	2,471	840.7	13.9	4.8
Central ..	3,752	2,991	2,248	1,422.9	132.0	36.9
Nor'west.	956	344	143	283.5	2.0	.4
Western..	3,595	2,095	921	1,027.3	21.2	1.8
Pa. Coast.	502	267	229	156.1	12.8	4.0
Mountain	156	97	66	32.6	.9	.1
Total...	16,512	12,443	8,935	5,209.5	530.0	235.5

Section.	*Butter.** (In millions of lbs.)			*Cheese.** (In thousands of lbs)		
	1890	1880	1870	1890	1880	1870
N. Eng'd.	63.3	65.4	49.5	1,908	5,344	11,191
Middle ...	185.3	202.6	177.4	4,788	9,440	23,953
Southern.	211.2	120.6	61.4	586	464	502
Central ..	277.0	230.8	156.2	3,007	6,295	12,378
Nor'west.	56.2	22.0	10.2	1,346	641	266
Western .	189.9	115.5	48.5	2,550	2,074	1,565
Pa. Coast.	35.1	17.9	9.7	4,209	2,829	3,492
Mountain	5.7	2.4	.8	332	184	145
Total ...	1,023.7	777.2	514.0	18,726	27,271	53,492

Butter Increases, Cheese Decreases.—In 1879 a large percentage of the cheese was made on the farms, but in the next ten years the conditions changed materially, and probably the greater proportion of cheese is now made in factories. Even with the large increase of butter factories the production of butter on farms increased thirty per cent. during the decade, while the production of cheese decreased thirty-one per cent.

The Milk Manufactured.—The butter made on farms in 1879 was 777 million pounds and 27 million pounds of cheese, while in 1889 the production of butter reached nearly 1,014 million pounds, and cheese had fallen to less than 18½ million pounds. Making a liberal estimate of twenty-five pounds of milk for one pound of butter, and twelve and one-half pounds of milk for one pound of cheese, we find that there was used 2,470 million gallons of milk in 1879, and 3,186 million gallons in 1889 in the production of butter and cheese on farms. Taking this amount used in 1889 from the total production of over 5,209 million gallons, and it leaves 2,023 million gallons of milk used in making butter and cheese in factories, and otherwise consumed.

Extent of the Whole-Milk Traffic.—Now granting that the increase in the amount of milk used in butter and cheese factories was as much as the increase of butter made on farms, viz.: thirty per cent., or the decrease in cheese (and it must have been fully as much, if not more), and we would find that about 689 million gallons was used for this purpose. This would leave, then, about 1,334 million gallons to be consumed in cities, villages and on farms.

With a population of 63,000,000 inhabitants, this

*Total produced or made on farms.

(*Continued on Page* 99.)

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The Dairy Industry.

(*Continued from Page* 98.)

indicates a per capita consumption per annum of about 85 quarts of milk as whole milk. Adding five quarts for the milk produced by the cows owned in cities and villages (not on farms), and our milk trade is about 90 quarts per head of population per year, worth to the farmer say $2.50, and costing the consumer about $5. This indicates that producers get about $150,000,000 for the milk that represents to consumers a value of $300,000,000.

No Comparison Can be Drawn between the total production of milk for the two census years, for the figures have been taken so differently, but it is valuable to know the total product as shown in the accompanying tables. A study of the tables discloses some interesting facts.

There has been an enormous falling off in the production of cheese on farms, not only in New England and the Middle States, but in the Central ones as well. This is accounted for, as we have said, by the increased quantity made in factories. But a further study shows there has been a decrease in butter production on farms in New England and the Middle States. This can be accounted for not alone by the increase of creameries, but from the fact that the large cities of New York, Philadelphia, Brooklyn, Boston, and many smaller ones consume much more milk than formerly.

The Number of Milch Cows shows an increase in every section, but this gain is greatest in the newer parts of our country. The increase of dairy products is not due alone to the increase in the number of milch cows, but also to the improved of the same and better care and feed. According to the figures given the average yearly production per cow is but 315½ gallons of milk, or 1,262 quarts, or 2,682 pounds. Allowing twenty-five pounds of milk to a pound of butter, this is equivalent to 107½ pounds of butter, and with the very liberal allowance of twenty pounds of milk for a pound of butter, the yield is raised to but 134 pounds. Progressive dairymen now concede that there is no profit unless their cows yield 200 to 300 pounds of butter per year!

No Farmer Should be Without It.—I find the AMERICAN AGRICULTURIST not only interesting and pleasingly written, but of great value to farmers everywhere. No farmer should be without it in his home.

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ANIMAL AILMENTS.

Hen Lice on Colt.—Nicholas Sterne, McPherson Co., Kan., writes for a remedy for hen lice on a spirited colt. The colt bites himself within reach of his mouth so as to make sores, stamps, kicks, and rubs himself raw. Small eruptions spot the skin and the hair falls out, making a bad appearance. Sponge or brush well with kerosene and carbolic acid, one part to ten, and thoroughly brush every part with the moistened brush. Next day sponge all the spots with soft-soap suds, rub dry and smear every spot with sulphur ointment. Alternate with decoction of tobacco lightly applied. Remove the colt from all other animals, and when tied outside of the stable, close up the doors and windows in the morning, and burn in an iron pot placed upon a flat stone to prevent danger of fire, sulphur and kerosene. Leave closed for four hours. Sweep all clean and whitewash with crude petroleum added to the whitewash, or crude carbolic acid. No light nor fire should be brought near the colt when kerosened. Cleanse the hennery the same way once a month.

Dog Poisoned With Paris Green.—A subscriber who had an intelligent and serviceable dog poisoned with Paris green, gives all the symptoms of vomiting, bloody purging, inflammation of the mucous membranes of the stomach and intestines, and asks if it could all be produced by lapping water from the sprinkling pot containing Paris green for destroying potato beetles. These are the symptoms and the post-mortem appearances from arsenic poisoning. Dogs and other farm animals are liable to be poisoned by carelessly exposing poisonous solutions which are being used as insecticides. Greater care should be taken with these dangerous poisons.

Squinting.—Silas Glover, Anderson Co., Ky., has a highly prized foxhound that squints, or has become cross-eyed, and desires to know if it can be cured. Squinting in the lower animals is a sign of indigestion, worms, brain trouble, arsenic poisoning, or poisoning from lead in the horse or ox. Give three tablespoonfuls of castor oil followed in a day or two by two-grain doses of santonin rubbed up with sugar till three doses have been taken, and then give a tablespoonful of castor oil. Or, perhaps, for dogs who vomit easily, a dessertspoonful of syrup of ipecac may be given, and then followed by the santonin and castor oil the next day after thorough vomiting has cleansed the stomach and removed local irritants of whatever kind. As this condition may result from cerebral meningitis, or compression of the brain from a blow on the head, or a kick from a horse or from cattle, the dog's head should be carefully examined for wounds.

Varicose Veins.—John Chase, Washington Co., Utah, is desirous of knowing what causes the soft, long swellings of the veins in one hind leg of an ox he uses with a mate for heavy short hauling. They are crooked, bunchy cords, soft and without any pulse. It results from lack of tone in the tissues of the veins, and from cold, exposure, strains, and lack of tonic foods. Bandaging, better food, containing small doses of iron and gentian daily will help, but economy would indicate stall feeding and slaughtering for beef, as treatment will be of doubtful utility. Even though a chronic inflammation of the coats of these veins might have been the cause, the same conclusions follow.

Tuberculosis in Cattle. — Joseph Stickner, Cayuga Co., N. Y., wishes to know how to detect cows that have tuberculosis early in the attack. It is a matter of great importance to be able to detect this infectious disease in the dairy, as from two to sixteen per cent. has been found to have been the death rate of the disease. Young cows up to five years of age are by far less liable to the disease. But cows from five upwards show a rapid increase of percentage with every advancing year. Cows that have been the most profuse milkers are relatively subject to tuberculosis, rendering their milk and meat more and more dangerous for human, or other consumption. The most positive diagnosis of bovine tuberculosis is assured by inoculation with tuberculin, but this presupposes the supervision of an expert. Robert Koch discovered and cultivated the bacillus of tuberculosis in 1882, and although scores of earnest investigators have since devoted their life work to the subject, but little further advancement has been made. Long before apparent impairment of the health of the tuberculous cow occurs, various tissues and organs may be seriously infected. Thin, watery milk, loss of flesh, swollen and hard udder, and degeneration of its tissues, generally of the posterior quarters of the bag soon follow. The disease may be confounded with parasitic diseases of the brain, the lungs, the intestines, and with actinomycosis or lumpy jaw, and with other diseases. In fact, early in the disease the diagnosis is difficult. The detection of tubercle bacilli demands the expert veterinarian, or human physician. The injection of an extract of tubercle bacilli under the skin of tuberculous animals early and even but slightly infected, causes an increase of animal temperature or fever, while animals not infected show no signs of fever. But up to the present date, fuller confirmation of this method of diagnosis seems to be needed to fully establish its complete reliability.

Tongue Cut with Wire Bit.—Peter Folk, York Co., Pa., states that a tough-mouthed young horse had his tongue badly cut by a wire bit, and desires to know what to do to heal it. Give the animal rest, feed soft food, and apply twice daily by daubing with a swab wet in a solution of ferric alum of one dram to two ounces of water. When the tongue has healed, use a large leather covered bar bit, as severe bits make hard, dangerous pullers.

Foul Skin in Hogs.—T. V. Sonris, Suffolk Co., N. Y., states that his hogs have a rough and scurvy skin. Those of the same litters which are running out are not at all affected. Though the hogs are not sick, they do not thrive as they should. The pen is frequently freely littered with eel grass and sea weed, there is plenty of air and no cover or roof over the pen. Two have long cracks at the hoofs and behind the ears. The rain and mud of filthy pens doubtless is the cause of the whole trouble. Clean out the pen, cleanse the hogs with chloride of lime, water and crude carbolic acid. Use a broom with a strong cord low down on the brush, and use plenty of the wash and apply vigorously, and undoubtedly the hogs will daily improve. Cleanliness is better than medicine.

Sleepy Staggers.—Daniel Meeker, Koufman Co., Texas: Sleepy staggers, or coma, is characterized by drowsiness, partial insensibility, sluggishness, and sometimes by a staggering gait. Generally the horse is gorged with hay and is constipated. In long-standing cases the animal is so stupid as to be indifferent to the command to move, and not at all or only slightly sensitive to the whip. The treatment, except where the brain symptoms are markedly prominent, must consist of a few brisk purgings. For this purpose six drams of powdered aloes, six drops of croton oil, one dram of capsicum, made into a ball and given on an empty stomach, should be resorted to at once. These balls should be put up by a druggist, as the croton oil is somewhat dangerous to handle. After the cathartic has operated, it should be followed, for a day or two, or longer, with a powder of pulverized hydrastis, pulverized ginger and bicarbonate of soda, of each four ounces, mixed and given in a small bran mash, and a handful of whole flaxseed should be given occasionally at night. The food should be digestible. The hay should be moistened and given in small quantities. But in acute cases, with violent symptoms, the veterinarian should always be called, as bleeding, local application of ice to the head, and more active treatment must be used to save the life of the horse.

Exostosis—Bony Tumors.—M. Bee, Westchester Co., N. Y., has a valuable young horse that has for some months past shown lameness after having been driven. After standing in the stable over night, and being driven next day, no signs of lameness are seen. But after a short drive the lameness comes on. No tenderness about the feet or limbs can be detected. No fever has been noticed, and the change of shoeing has been of no service. On examination, lameness was apparent in the off fore leg or foot, and probably also in the rear hind limb or foot. The lameness before was marked, and that behind somewhat masked. Minute bony tumors were found on the inner face of the shaft of the off fore leg near the knee, and others less prominent near the inner ankle. Also a very small exostosis on the inner surface of the hock of the nigh hind leg. The inflammation of the periosteum was so slight that rest removed the pain; but exercise aroused the inflammation so as to excite pain. It is evident that when fatigued the left fore foot scuffed so as to strike the inner edge of the shaft of the off fore leg, thus exciting a low grade of inflammation of the periosteal covering of the bone, and causing incipient secretion of bony matter, which was irritated by exercise causing lameness only after work. The prognosis or presumption of the case is, that as there is a tendency to bony deposits, rest, good shoeing and booting will relieve, yet will not cure the case. And as the animal is a gelding, breeding cannot be resorted to, and should not if it were a mare or stallion, as the evil tendency might be perpetuated. On the farm the horse might be serviceable for many years.

Rheumatism in Cattle.—John Vest, Marion Co., Tenn., has a cow that is stiff all over; she had a fever; her nose was hot and dry; then one ankle joint was affected, which was so tender and sore that she could not bear her weight upon it. The next day it shifted into the knee of the other leg, which swelled and was so painful that it could not be rubbed with liniment. After a week she got better, but still has soreness in her legs at times. This is rheumatism. It is a peculiar blood disease that causes inflammation of the joints. To relieve the pain, give two ounces of laudanum in water, or gruel, followed by dram doses of salicylate of soda in half a pint of gruel every two hours till the fever and pain subside, then discontinue the medicine. Milk regularly, but do not use the milk of cows taking medicine. It may be given to the pigs with plenty of other food. The cow should have a warm, dry, clean box-stall, with plenty of sunlight and pure air, but no drafts. Apply flannel bandages to the swollen leg or legs, and warmly blanket the cow. The limb may be painted with tincture of iodine and laudanum equal parts, and thickly covered with cotton wool and flannel bandage. Hot, watery slop, in which flaxseed meal is stirred, will keep the bowels regular. Warm water will be best for drink. If necessary to regulate the bowels, Rochelle salts are both efficient and also exert a curative effect in rheumatism. Placed in the slop night and morning, in two to four ounce quantities, until the bowels are loose, then continued for a few days in ounce doses at night, will often obviate the necessity to again resort to more powerful remedies.

Worms and Indigestion.—Homer C. Shreeves, Benzie Co., Mich., desires to know what to do for a four-year-old that is in foal, having worms and indigestion. Thinks both have been brought on by feeding cornstalks. Is now feeding hay and three quarts of boiled rye a day. Give half a pint of linseed oil at night followed by half a pound of Glauber salt and half that quantity of common salt finely powdered, or dissolved in a pint of hot water mixed in a bran mash in the morning, to which four ounces of powdered gentian is added and well mixed. Rye is dangerous food for mares in foal. Feed ground oats and bran, and but little hay, thoroughly dusted and moistened. Add a tablespoonful of powdered gentian to every feed. Give no aloes balls to mares in foal. Injections of bran tea in which a handful of common salt is dissolved will remove worms from the rectum.

Shaky Fore Legs.—P. J. Vore, Miami Co., Ohio, has a three-year-old gelding that seemed sound until last December, when, being put to training, he trembled in the fore legs and showed signs of being "knee-sprung," or bending the knee forward with a tremulous action of the muscles. Turn out the colt for a year. Give frequent hand rubbing with extract of witch hazel over the back tendons. The ground may have been too hard and your training too severe, together with a weak condition of the legs which were injured.

Troublesome Calving.—Frank W. Lighton, Lycoming Co., Pa., has had trouble with his cows at calving, especially in the retention of the "afterbirth." The cows are Jersey and Guernsey. Unless in-and-in breeding has produced debility, the breed has nothing to do with the trouble. The sowed corn fodder is not as good as hay, but the other feeding was fairly good. Pregnant and milch cows should have roots especially during the latter part of pregnancy and during lactation, except when at pasture. After calving, give immediately half a pail of warm, thin wheat-bran. If after a day the cow has not cleansed herself, the afterbirth should be removed.

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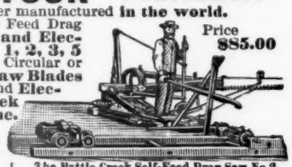

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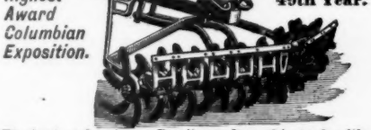

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THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

TOPICS OF THE TIMES.

An Onslaught of Butter Substitutes.

The production of oleomargarine and butterine is assuming most enormous proportions. Their sale in original packages is being pushed throughout the Eastern and Central States in defiance of all State laws. Armour has brought suit in the Federal courts to restrain the Commission of Agriculture of New York State from interfering with Armour's sale of oleo in original packages by attempting to enforce State laws regulating its sale. A Federal judge in the State of Oregon has just rendered a decision rendering inoperative the existing national law regarding oleo on the ground that its provisions were only general, and Congress has no constitutional power to authorize the Internal Revenue Bureau to prescribe regulations for its enforcement.

Congress Must Act.—The oleo combination are thus taking advantage of the decision of the United States Supreme Court that States have no authority over liquors or oleo sold in the original package in which they are put up. Congress promptly thereafter enacted a law conferring State authority over liquors in original packages. Mr. Hill has introduced into the United States Senate a bill conferring like authority to the States over oleo in origiual packages. Unless this bill is promptly enacted, the competition of oleo sold as butter for butter and at less than butter prices, will most seriously affect the dairy industry.

The National Dairy Union, composed of delegates from all the various State dairy, butter, cheese and creamery associations, was organized at Chicago last month to grapple with this evil. State Boards of Agriculture and dairy commissions are also alert. It is imperative that every one interested at once write to his Senators and Representative at Washington in behalf of urgent action on the Hill bill. Petitions, resolutions, etc., should also be hurried to Washington. To facilitate matters, the AMERICAN AGRICULTURIST will forward its subscribers' applications for the necessary petition blanks to an agency that will supply them if postage stamps are inclosed.

PRODUCTION OF OLEO (MILLIONS OF POUNDS).

Fiscal Years / States.	1893	1892	1891	1888
Rhode Island	6.9	5.3	5.1	6.7
Illinois	39.4	39.1	30.1	17.8
Indiana	1.1	1.1	....	3.9
Kansas	10.6	10.4	3.9	1.8
Missouri	1.5	1.4	0.8	....
Ohio	3.1	3.1	2.4	1.3
Pennsylvania	0.7	0.2	0.6	1.4
Others	3.9	3.9	1.5	1.4
Total	67.2	64.5	44.4	34.3

INCREASE IN THE TRAFFIC IN FIVE YEARS.

States and Years.	*Factories.*		*Jobbers.*		*Retailers.*	
	1893	1888	1893	1888	1893	1888
Rhode Island	3	....	8	....	348	....
Illinois	7	10	19	23	1,446	590
Indiana	1	1	5	5	253	32
Kansas	3	2	1	1	228	38
Missouri	1	....	15	17	758	115
Ohio	2	4	9	6	399	209
Pennsylvania	1	3	20	3	196	110
Connecticut	....	7	3	12	95	286
Iowa	1	....	5	1	136	1
Kentucky	....	....	4	4	151	96
Massachusetts	....	1	28	25	192	330
Michigan	....	....	20	23	355	204
New Jersey	....	....	1	2	141	35
Wisconsin	....	....	5	11	144	44
Others	3	2	140	33	1,527	226
Total	22	30	283	166	6,369	2,316

The Serious Effects of the fraudulent sale of oleo as butter is already felt in the butter market, and are likely to be still worse before spring. Let State laws be enforced so that the stuff may be sold and consumed on its merits. The production of oleo is always greatest during the winter when butter prices are highest, as it can be sold for twenty-five to fifty per cent. below the price of butter, and still pay enormous profits. Last summer the output was three to three and one-half million pounds of oleo per month, but for December, 1893, and January, 1894, we estimate it at three to four times this quantity.

Not only is our home trade in butter affected, but our export butter trade has been well-nigh ruined by the competition in foreign markets of American oleo. In the first ten months of 1893, the United States exports of butter were to the Tropics 3¼ million pounds, to Europe 2½, or a total of six million pounds; whereas in the like period of 1889, the figures were respectively 4 and 5¾, or a total of 9¾ million pounds, showing a decrease of more than one-half in our butter exports. During the same time exports of oleo jumped from 35 to 101 million pounds, the Tropics now taking five times and Europe three times as much as five years ago. These exports were mostly in the form of oleo oil, used abroad to make margarine and "filled cheese." Hence it is that United States cheese exports were only 66 million pounds in the first ten months of last year against 85,000,000 pounds in the like period five years ago.

Compared to the Dairy Industry, the oleo business has no claims to special consideration. Against 22 oleo factories, place 17,000,000 cows producing milk and cream equivalent to 125 pounds of butter a year. Against 67 million pounds of oleo, place 2,125 million pounds of butter, or its equivalent in milk and cream. Against oleo costing less than seven and one-half cents per pound to produce, place butter costing over fifteen cents. Against an annual cost of the oleo product of $5,000,000, place the $320,000,000 which it costs to produce honest dairy products.

Is there any reason whatever why oleo should be fraudulently sold to depress the prices of a product sixty times more costly? By all means let the United States Senate act quickly, and confirm the States in their police power over this article!

That He Who Runs May Read.—The Indiana experiment station has taken the novel plan of sending large handbills to cross roads, groceries, post offices, and other public places in the State, requesting parties to post them up in conspicuous places. These handbills set forth, in large type, some facts discovered at the station about the benefit of furnishing cows with shelter. Three cows of about equal capacity with three others, were sheltered, while the others were let run loose. All were fed alike. The exposed cows gave considerably less milk. They also lost in weight, and there was an estimated difference in favor of the sheltered cows of about thirteen dollars in the two months' trial. This is a lesson that every farmer should take to heart, whether he is selling milk or not. The fact that shelter saved thirteen dollars on three cows in about two months can easily show the loss on all cows that are allowed to stand in the mud and rain all winter, to say nothing of bitter cold weather when they can hardly eat enough to keep heat in their bodies. Humanity and selfish interest go hand in hand in this instance. The zeal of the Indiana station to get its results to the farmer must be commended.

The Financial Crisis of 1893.—Probably no other country has ever incurred in so short a time such an amount of financial and industrial disturbance as the United States has recently experienced. The farmers alone, according to David A. Wells, in the *Forum*, lost enormous sums by the forced sale of their wheat to Europe at panic prices, through the inability of the banks of the country to supply money to its owners, that they might hold their product for better times and markets. During the months of July, August and September, sixty million bushels were exported from a comparatively small crop. The national treasury, of late years so overflowing with surplus revenues that millions of dollars were given for the privilege of simply anticipating the payment of debts funded at low rates of interest, now faces the certainty, independent of any change in the methods or rates of taxation, of an annual deficit of necessary revenue of something like $30,000,000. In 1893 the usual loss by fire was increased by $25,000,000. During the summer months half a billion dollars were withdrawn by depositors from the banks, and in consequence the national banks alone were compelled to call in loans to the extent of $318,000,000, and 585 banks suspended. There were 16,000 business failures in 1893, one-third more than in any other year. The loss to owners and workmen by the closing of shops and factories will aggregate a billion of dollars. The immediate and principal cause was, beyond all question, a distrust of the currency, the very foundation upon which the whole superstructure of the trade and credit of the nation rests; for, at the very time, money was easily obtainable elsewhere, at low rates of interest, by the citizens of all other great nations. The circumstance that the United States has for many years, by reason of its great natural resources and the energy of its people, maintained a high degree of prosperity under conditions that would have occasioned revolution or ruin in other countries, has unquestionably encouraged a sentiment among its citizens that they have a supremacy over all accidents, and that the precedents of economic experience on the part of other nations are matters to them of very little importance. These citizens, who select the legislators and determine the policy of Federal and State governments, have too little faith in, or knowledge of, economic principles, and do not recognize that hardly a method can be proposed for the material advancement of mankind which has not been somewhere and at some time practically tried, and that the resulting experiences are worth studying. The American republic has little to fear from the open advocacy of anarchy, or the use of dynamite, or from processions marching after red flags. The common sense of its people will take care of all these things. But it has reason for fear from the enactment of laws which tend to injure and leave unstable the standard of value in exchanges; which provide for discriminating taxation; which impair contracts, and which sanction the imposition of taxes for private rather than for public purposes. The remedy is to be found in a better popular education in the financial history of other nations and centuries. Fortunately, the crisis is now over, and the public faith is again upholding our many industries.

Co-operative Feed Buying. — The universal practice of giving cows ground feed, either for all or part of the season, entails a large expense upon the dairyman. In these days the effort is not so much to find how much the cows can be made to produce as it is to know how they can be made to pay the largest profit. Economy of production is the order of the day. To do this, all feeds that must be purchased should be bought at wholesale, and if one man does not use enough, several neighbors can join in the purchase. It is now becoming quite a common plan for the creamery manager to buy feed in carloads and let the patrons have it at wholesale prices. Some factories report handling feed in this way to the amount of $8,000 for the season. If bought at the time the country mills are in full blast, and when they are crowded with this offal, good bargains can generally be secured. If put in a loft, and not piled too deep, it will keep in good order as long as needed.

Canned Tomatoes in 1893. — Last year was a good season for tomato canners, as the sales for future delivery during the first half of 1893 were unusually heavy. The industry was stimulated by high prices for canned tomatoes during May, June and July, which caused a largely increased planting. An overstocked market was prevented by a short crop in some sections. During the year 1893 the output of canned tomatoes in the United States and Canada was 4,395,540 cases, which is over one million more cases than were canned in 1892. This is equivalent of over one hundred million cans, or eight cans per year for each family of five persons.

The Future of British Wheat Growing.—W. R. Mallett, of the Exwick Roller Flour Mills, England, writes us: "Under the pressure of uncommonly low prices wheat growing has fallen to a sorry and serious basis. So much so that land, in many cases, is lying fallow because of the profitless crop, and wheat land farms are everywhere more and more difficult to dispose of. Where this most serious state of affairs will end it is impossible to say, but to my mind the matter largely depends on whether foreign exporting countries can continue raising wheat and sending it here at the present prices at an actual profit to the grower. As an illustration of the rapid decline of wheat production here, I will mention that in thirty years the acreage has gradually fallen from four million acres to two million acres, and the crop which averaged thirty-eight million pounds from 1852 to 1860 has fallen seven million pounds in 1893."

The Russian Thistle.—This new weed has imported itself into the Northwest, principally the Dakotas, from Eastern Europe or Western Asia, and threatens to become a terror to the farmers wherever it gets a foothold. The principal trouble to be anticipated from it comes from its ability to make such rapid growth in dry seasons as to take entire possession of the ground, and then ripen dry with such hard and vicious thorns that animals cannot pass through it without great injury to their legs. The wheat fields of the West are not only threatened with its taking possession of

TOPICS OF THE TIMES.

the land, but it has the further objection of being a "tumbleweed." That is, it grows large and bushy, with a small stem, so that when it dries and the seeds are ripened the wind breaks it loose near the soil and rolls it about the country, scattering the seeds, and when once kindled it readily jumps the fire breaks, carrying destruction to buildings and standing crops. The damage done by this weed in the year 1892 in the two Dakotas has been computed at $2,000,000, and those farmers who are threatened with it should lose no time in eradicating it by all methods.

The Ellerslie Guernseys.—All lovers of Guernseys will be pleased to know that Levi P. Morton is making up a new herd of this breed, to take the place of the one so unfortunately destroyed by fire last winter. He has bought the bull Deputy, 2917, said by those who have seen him to be a superb animal. The kind wishes of every one will go with Mr. Morton in his endeavor to advance the interest of this famous butter breed of dairy cows.

A Dread Disease Extirpated.—Sufficient publicity has not been accorded to the declaration regarding contagious pleuro-pneumonia by the United States veterinarians' medical association at the international congress at Chicago, in October. This body was composed of the leading veterinarians of America, many of them being State and federal officials who had charge of the work of combating this disease. The unanimous declaration of this organization is that "the most satisfactory evidence and conclusive testimony has been presented that our country is entirely free from a single case of contagious pleuro-pneumonia, and no doubt has been so for the past two years." Hence the association asks of Great Britain the entire removal of her quarantine regulations applying to that disease in the United States. "It having been clearly demonstrated by the Canadian department of agriculture that the disease does not exist in Canada." It is the opinion of the congress that the quarantine of the United States against Canadian cattle is unnecessary and should be removed, and that we ask of Canada a similar consideration in regard to the freedom of trade between Canada and the United States.

The Next World's Fair.—The International Exposition of 1894 will be held at Antwerp, Belgium, beginning May 5th, and closing Nov. 12th. An American building is to be erected, in which there will be more space for exhibits from the United States than have been shown at other World's Fairs in foreign countries. The American Propaganda, having been appointed by the administration of the Antwerp Exposition, agents for the United States, it is now ready to receive applications for space in the American building. The Secretary is James P. Holland, 741 Monadnock Building, Chicago, Ill. The American Propaganda propose to place before the buyer a sample of the American commodity for sale, and to supply with this complete information about the product and the terms of sale, which for business purposes will be even more far-reaching than the ordinary display. Immigration associations, State boards and agricultural societies may display placards and sell goods, and otherwise participate in the benefits or the exposition.

Aberdeen-Angus and Uniform Herds.—The American Aberdeen-Angus Breeders' Association offers at all State fairs in 1894 a premium of $100 each for the "grand sweepstakes," aged and young herds, if won by Aberdeen-Angus herds, and also duplicate premiums in "grand sweepstakes by ages," won by Aberdeen-Angus individuals. By State fairs in the three following States is meant the "St. Louis Fair" in Missouri, the "Detroit Exposition" in Michigan, and the "Kansas City (Mo.) Fair" in lieu of Kansas State Fair. The association recommends to all "Breeders' Associations" and to State fairs the adoption of uniformly graded herds as follows: Adult herd of one bull, two years old or over; one cow, three years old or over; one heifer, two years old and under three; one heifer, one year old and under two; one heifer, under one year old. The young herd to consist of one bull and four heifers, all under two years old, and bred by exhibitor. It was the sentiment of the association that breeders be encouraged to exhibit only where herds are graded in conformity to the above. The secretary is Thos. McFarlane, Harvey, Ill.

An Old Lady's Escape.

Saved From The Verge of Eternity At The Age of Sixty.

AFFLICTED WITH DROPSY FOR FIFTEEN YEARS —PHYSICIANS WERE BAFFLED—MEDICINES FAILED—SAVED AT LAST.

(From The Times-Union, Albany, N. Y.)

It is a very easy thing to make assertions, and a very hard thing to disprove the average mis-assertion. Readers of the daily newspapers in the main have no disposition to investigate the many stories told by patent medicine advertisers. It would take too much time. This fact has made this mode of deception so common, and also that of purchasing statements from unprincipled persons, that at last the *Times-Union* determined to find out whether its readers were being daily deceived in the matter or not. An admirable opportunity presented itself in the shape of a report that one Mrs E. Lewis of Prattsville, N. Y., had been cured of a serious illness in a remarkable manner. A reporter visited Prattsville and soon located Mrs Lewis. She keeps a millinery establishment and is one of the best known and most respected of the village inhabitants. She is a well-preserved woman of about sixty years of age, with gray hair, but looking very bright and vigorous. She was very willing when the subject was introduced to tell her experience, which was as follows:

"I have lived in Prattsville for forty years and up to within fifteen years ago I enjoyed the very best of health. Then I began to be troubled with a swelling in my feet that gradually developed into dropsy. My husband, who was alive then obtained good medical advice, but I continued on the whole to grow much worse, and finally became so that I could not stand upon my feet without suffering the most intense pain.

"A year ago my condition became so very critical, that I sent for some dropsy medicine which had been recommended to me, but as there was no improvement, about six months ago I became quite discouraged and stopped it. Then I saw an advertisement of Dr. Williams' Pink Pills for Pale People. I took 8 boxes according to the directions. Before I had finished my third box I began to experience relief, and before the eighth box was consumed the swelling had left my feet entirely and I was able once more to attend to my household duties and give more thought and time to my business. What, however, has pleased me even as much as my relief from dropsy, is the fact that with my improvement in blood circulation, my heart has also ceased to be so extremely troublesome. I have always been troubled with my heart, however, and for years have not dared to go about at all without a bottle of brandy at hand. When, after taking the Pink Pills my dropsy left me, I found also that my heart had ceased to trouble me, and that the horrible feeling of suffocation that had so often terrified me in the old days had almost disappeared. I have not been compelled to take any brandy lately and, as a matter of fact, I am in the best of health, far better than for twenty years past. Nobody has ever asked me to write a recommendation, and all was done of my own free will."

The reporter told Mrs Lewis that he wished to make her statement public, and so that there should be no manner of doubt thrown upon the matter, it would be well for her to swear to the statement. She expressed her utmost willingness to do so, and in the absence of a notary public the services of the village Justice of the Peace, Hon. Geo. R. Laverack, and following affidavit was made:

The above was subscribed and sworn to before me this 25th day of May, 1893.

G. R. LAVERACK, *Justice of the Peace.*

Afterwards Mr Laverack was asked about Mrs Lewis and he said: "Mrs Lewis is very conservative, and the fact that she has volunteered the above statement is sufficient endorsement in my eyes."

An analysis of Dr Williams' Pink Pills show that they contain, in a condensed form, all the elements necessary to give new life and richness to the blood and to restore shattered nerves. They are an unfailing specific for such diseases as locomotor ataxia, partial paralysis, St. Vitus' dance, sciatica, neuralgia, rheumatism, nervous headache, the after effect of la grippe, palpitation of the heart, pale and sallow complexions, and all forms of weakness either in male or female. Pink Pills are sold by all dealers, or will be sent post-paid on receipt of price, (50 cents a box or 6 boxes for $2.50—they are never sold in bulk or by the 100[s] by addressing Dr Williams' Medicine Co., Schenectady, N. Y., or Brockville, Ontario.

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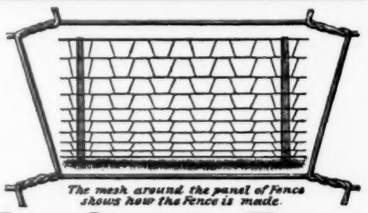

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Bookkeeping for Farmers.

One of the most encouraging signs of the times is the increasing interest in keeping farm accounts. In most sections of the country, the agricultural year begins with March 1st or April 1st, as being the most convenient date for settling up the farm business, although many begin their fiscal year with the first of January Even if a farmer keeps no record of accounts, the least he can do is to take an annual inventory of his entire property, and also of what he owes and of what is due him. Compare this with a similar record a year ago and he can judge roughly as to whether he is better or worse off. But a more comprehensive plan should be generally adopted. The work is not complicated, and for most farmers a few minutes each day, or an hour a week, will be sufficient to keep a very close record of all their operations, including work on the different crops. etc.

The value of such a simple system of bookkeeping is at once apparent. It enables the farmer to know just what the various articles of produce cost him. If they cost him too much, it will lead him to see wherein they can be produced cheaper or some other crop substituted that will be more profitable. By keeping himself constantly informed as to his financial condition, he will avoid expeditures that he really cannot afford, will keep his credit good, and will be more likely to make a financial success of the business.

The only simple treatise on this subject is that by T. Clark Atkeson, professor of agriculture at West Virginia University and President of the Board of Agriculture of that State. He gives a brief description of a simple system that any farmer can make use of without buying expensive books. The second part of the work describes the Stockbridge system of farm accounts, as taught by Prof. Levi Stockbridge at the Massachusetts Agricultural College, which has been adopted on a large scale in New England. The price of the booklet is twenty-five cents.

George A. Rogers's farm account book, price fifty cents, is a simple and excellent affair for keeping a record of the year's business on the farm. A more thorough system is that announced by the Farm Account Publishing Co., and its excellent account book and pamphlet explaining this system is furnished complete for one dollar. A still more elaborate work is Goodfellow's daily farm account book, the general edition being sufficient for five years and costing $2.50, the ten-year volume selling for $4.00. Any of these books will be supplied at the prices noted by the Orange Judd Company.

Fancy Farming.—E. Welsh, Dawes Co., Neb.: Dog farming is a rare thing, though some farmers make a practice of not only raising fine dogs for the markets, but of boarding, training, and keeping valuable breeds for wealthy hunters. On a large farm there is little trouble in keeping the dogs, and yet the work proves remunerative. Dog fanciers can easily master the art of breeding, feeding and training, and there is no reason why the ordinary farmer should not add this profitable recreation to his labors. Pigeon and bird-raising farms are scattered throughout the country. Fancy pigeons require a fuller and more extended knowledge of the art of breeding than many possess, but the work of raising ordinary pigeons and squabs for market is not a difficult nor disagreeable labor. There is money in it, too; for the demand for both squabs and pigeons is great in all of the large cities. Deer farms are chiefly confined to the Western and Southern States, but a few farmers, located so far from markets as to make general produce raising unprofitable, have found pleasure and a good income in raising deer. There is no pleasanter animal to associate with than the deer, and one soon becomes greatly enamored with his work. Deer farms will increase in number and size in this country, as the large tracts of woods and prairies are settled and the shy creatures are exterminated or driven out of the country.

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GREENHOUSE CONSTRUCTION. A Complete Manual on the Building, Heating, Ventilating and Arrangement of Greenhouses, and the Construction of Hotbeds, Frames and Plant Pits. By L. R. Taft, Professor of Horticulture and Landscape Gardening, Michigan Agricultural College. Illustrated. New York: Orange Judd Company. 1894. 208 pp., il., 12 mo., cloth, $1.50.

The immense quantities of vegetables and flowers now grown under glass for the winter markets of the large cities has given a great impulse to the building of forcing houses and beds, and many changes and improvements have been made in their original construction, for the purpose of securing more sunlight, better heating and closer adaptation to plant needs. These are fully described and illustrated in this timely volume. The author has made, at the Michigan Experiment Station, a careful, comparative test of the various methods of building, glazing, ventilating and heating greenhouses, which he was able to do with scientific accuracy, by reason of his fifteen years' experience in greenhouse management and a large experience in greenhouse construction, together with his careful study of the methods employed by the leading flower and vegetable growing establishments in the larger American cities. Personal interviews and correspondence with leading florists, gardeners, and builders of greenhouses, have strengthened the reliability of every statement made in this valuable handbook. Greenhouses and conservatories, hotbeds and cold frames, forcing houses and pits, all receive full and detailed treatment. The lucid descriptions of each topic, and the 118 diagrams and illustrations, make every detail clear to both the amateur and professional gardener, or florist, and enable the beginner to proceed without fear of loss from errors of construction, or arrangement. Many of the illustrations are half-tone engravings from photographs of actual greenhouses and forcing establishments. This treatise is the only work published in America on greenhouse construction by practical American methods, and for the actual needs of American horticulture. Sold by Orange Judd Company, New York. Price, postpaid, $1.50

THE DAIRY INDUSTRY OF DENMARK. By Prof. C. C. Georgeson, of Kansas State Agricultural College. Being Bulletin No. 5 of the Bureau of Animal Industry of the United States Department of Agriculture. Government: Washington, D. C., 1894. 133 pp., 8vo., paper.

This volume is of especial interest to dairymen. It is the result of a personal study of the dairy industry of Denmark by Prof. C. C. Georgeson, of the Agricultural College of Kansas. A preliminary report, containing many interesting facts relating to the conditions of agriculture in Denmark, the importance of the dairy industry, increase in Danish butter exports, with some particulars as to the methods employed on some of the farms, and including a very interesting account of the Milk Supply Company of Copenhagen, was issued by the Department last spring. The present report is much larger, covering the same subjects as the preliminary report, only in greater detail as to methods of dairying, treatment of the butter, packing for market, together with detailed reports on several of the principal dairy farms and the coöperative creameries. The author also treats of dairy bacteriology, the construction of dairy ice houses, and devotes several pages to a description of the dairy cattle in common use in that country, and the improvement which has taken place in them as the result of more careful breeding for dairy purposes. Applications for copies of this report should be addressed to the Chief of the Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.

MANUAL FOR SOUTHERN BUTTER MAKERS. By Edwin Montgomery, Starkville, Mississippi. Published by the Author. 1893. 42 pp., il., 8vo., paper.

This treatise is clearly written, reliable and very practical. It is of especial use for farmers and dairymen in the cotton-growing States, where special methods are needed in the dairy. Sold by Orange Judd Company. Price, postpaid, 30 cents.

LIVE STOCK JOURNAL ALMANAC. 1894. Illustrated. London: Vinton & Co. 274 pp., il., 8vo., paper.

This year's book of the British live stock interests is fully up to its usual excellence. There are papers by eminent specialists on horses, cattle,

[*Continued on Page* 106.]

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(*Continued from Page* 105.)

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This first volume of the new Standard Dictionary bears evidence of the most careful and conscientious work of its able corps of editors. It has been in preparation for four years, and will be completed next spring. Every word of technical meaning has been defined by an authority who uses it as a part of his daily vocabulary, and the definition has then been criticised and amended, if necessary, by others engaged in the same vocation, so that the meaning given in the dictionary is the meaning used in the English language today. The ordinary reader who consults the dictionary to learn how a word is spelled, how it is pronounced, or the sense in which it is used by writers and speakers of the present day, will find this new Dictionary especially useful, for these items of information can be seen at the first glance, as they immediately follow the word. The definition of new and old agricultural words, and especially the new terms of agricultural science, are given correctly and according to the latest and best usage. There are several full page plates, illustrating the standard forms of the thoroughbred breeds of farm animals. This Dictionary is made for use by busy men and women, and every time-saving method and device has been wisely used.

DOMESTIC ECONOMY; Or, How to Make Hard Times Good, and Good Times Better. Designed to Aid in the Successful Management of the Affairs of the Family, the Home, and the Individual. By I. H. Mayer, M. D. Published by the Author. Lancaster, Penn., 1893.

The author believes that many households would be thrifty and economical if they knew how to be so, and in this useful volume he points out the way. He treats of the management of business affairs in the home and elsewhere, of the care and training of children, of health and disease, in fact, of every detail of the home life, which is the crowning jewel of civilization. Sold by Orange Judd Company. Price, postpaid, $1.

THE A B C OF POTATO CULTURE. How to grow them in the largest quantity, and of the finest quality, with the least expenditure of time and labor; carefully considering all the latest improvements in this branch of agriculture up to the present date. Fully Illustrated. By T. B. Terry, Hudson, O. Second Edition. Revised and Largely Re-written. Medina, O.: A. I. Root. 1893.

This popular book has been made much more useful by this revision, which has incorporated the added years of experience of the author in his specialty. Sold by Orange Judd Company. Price, postpaid, forty cents.

PROFITABLE POULTRY FARMING. By Michael K. Boyer. Author of "All About Broilers and Market Poultry Generally." Published by the Author. 1893. 78 pp., il., 16 mo., paper.

This manual treats of practical poultry farming; the best way to begin; running an incubator and brooder; feeding chicks; a butter and egg farm; how to test eggs; duck culture; and preparation for market. Sold by Orange Judd Company. Price, postpaid, twenty-five cents.

SUGAR ANALYSIS. Purity Table. After Koffman. Arranged and Calculated by Hubert Dyer, 22 California Street, San Francisco, Cal. 1893. $2.50.

This useful table for the rapid determination of the coefficient of purity in sugar analysis, will save much calculation by sugar chemists, as it obviates the necessity of all division of sucrose by Brix, and enables one to read directly the desired purity. In this respect Koffman's original table is so narrow as to be of little practical use. The table presents an almost solid mass of figures, sixteen-by-twenty inches, and is so arranged in squares and different styles of figures that reference is precise and rapid. Sold by Orange Judd Company. Price, postpaid, $2.50.

Other Publications.

MISCELLANEOUS WORKS.

IOWA INSECTS. Fruit and Forest Tree Insects. Some Iowa Farm Insects. By Herbert Osborn, Professor of Zoology and Entomology. Iowa Agricultural College, Ames, Iowa. Published by the Author. 67 pp., il., 8vo., paper. Thirty cents.

EFFECT OF DECOMPOSING ORGANIC MATTER ON NATURAL PHOSPHATES. The Standard Phosphate Mining and Chemical Co., Kendrick, Florida. Pamphlet.

COFFEE IN AMERICA. Methods of Production and Facilities for Successful Cultivation in Tropical America. Bureau of the American Republics. Washington, D. C. 36 pp., 8vo., paper.

NORTH CAROLINA, State Horticultural Society. Thirteenth Annual Report. 1893. By Gerald McCarthy, Secretary, Raleigh. 68 pp., 8vo., paper.

HORTICULTURAL AFFAIRS. From 1825 to 1891. By L. Menand, Albany, N. Y. Pamphlet.

NEW SPECIES OF PRODOXIDAE. By C. V. Riley, Washington, D. C. Pamphlet.

SCIENCE AND HORTICULTURE. Published monthly at San Diego, Cal. $2 per year.

STUDIES OF THE GENUS LACHNOSTEMA. By C. V. Riley, Washington, D. C. Pamphlet.

RUSSIAN CROPS IN 1893. Vol. II. Imperial Government, St. Petersburg. 1893. 154 pp., maps, 8vo., paper.

SELECTION IN SEED GROWING, Comprising Papers Read Before the Seedsmen's Session of the

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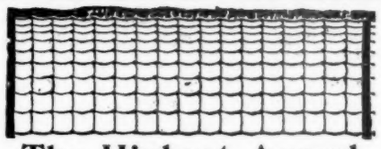

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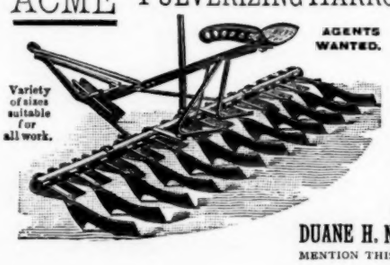

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World's Auxiliary Horticultural Congress, Chicago, August 16, 1893. With Discussion on Same, by Wm. Meggat, of Connecticut; T. W. Wood, of Virginia; Prof. L. H. Bailey, of New York, and others. The Seedsman's Trial Grounds, by W. Atlee Burpee, to which are appended several newspaper articles on "Modern Methods of the Seed Trade," "Seed Growing at Fordhook Farm." Philadelphia: W. Atlee Burpee & Co. 1894. 98 pp., il., 12 mo., paper.

AGRICULTURAL GAZETTE OF NEW SOUTH WALES. Monthly. Sydney, Australia. Ten shillings per annum.

AGRICULTURAL EXPERIMENT STATION BULLETINS.

ALABAMA—At Auburn. Varieties of wheat and grasses (B. 49). Fruit tree blight (B. 50).

CALIFORNIA — At Berkeley. Annual report, 1891-'92.

DELAWARE—At Newark. Fourth annual report.

FLORIDA — At Lake City. Treasurer's report. Soils and fertilizers (B. 20).

INDIANA—At Lafayette. Modification of Grandeau's method for determination of humus; Determination of crude fiber (B. 46). Does it pay to shelter milch cows in winter? Skim milk as a food for calves (B. 47).

MARYLAND — At College Park. Steer feeding (B. 22).

MASSACHUSETTS—At Amherst. Weather (H.B. 59).

NEBRASKA — At Lincoln. Cost of Farm Crops (B. 29). The influence of changes of food and temperature on the quantity and quality of the milk of dairy cows (B. 30).

NEVADA — At Reno. Potatoes; Tobacco (B. 20). Nevada weeds (B. 21).

NEW JERSEY — At New Brunswick. Analyses and valuations of fertilizers (B. 97).

OKLAHOMA—At Stillwater. Press Bulletin, No. 9.

PENNSYLVANIA—At State College. Influence of quantity of food upon economy of milk and butter production (B. 24).

RHODE ISLAND—At Kingston. Fertilizers; Oats; Potato scab (B. 26).

TENNESSEE—At Knoxville. Small fruits; Grapes (B. 3, VI). Field experiments with tomatoes and onions (B. 4, VI).

TEXAS—At College Station. Steer feeding (B. 27).

WISCONSIN — At Madison. The Russian thistle (B. 37).

WYOMING—At Laramie. Winter killing of trees and shrubs (B. 15). Grasses and forage plants for arid regions (B. 16).

CANADA—At Guelph. Weeds of Ontario (B. 91). At Toronto. Crops and live stock in Ontaria (B. 48).

UNITED STATES GOVERNMENT PUBLICATIONS.

UNITED STATES DEPARTMENT OF AGRICULTURE, Washington, D. C., publishes the following:

EXPERIMENT STATION RECORD, VOL. V, NO. 1. 146 pp. Contents: Editorial notes.—Changes in the organization of the office of experiment stations; investigations on the food of man; work by the U. S. Department of Agriculture in behalf of good roads; Belgian National Library of Agriculture; article on investigations at the Grignon Agricultural Experiment Station, by Emile Demoussy; abstracts of publications of the Agricultural Experiment Stations; abstracts of publications of the U. S. Department of Agriculture; abstract of reports of foreign investigations; titles of articles in recent foreign publications.

HANDBOOK OF EXPERIMENT STATION WORK.—A popular digest of the publications of the Agricultural Experiment Stations in the United States. Bulletin No. 15, office of Experiment Stations. 411 pp. A summary of the reports and bulletins issued by the Agricultural Experiment Stations in the United States, the information which they contain relating to agricultural subjects being brought together and condensed into short articles. These are arranged alphabetically, in order to make readily accessible the principal facts which have been published regarding recent agricultural investigations.

INSECT LIFE, VOL. VI., No. 2. Pp. 59-206. Principal contents: Proceedings of the Fifth Annual meeting of the Association of Economic Entomologists at Madison, Wis., August 14-16, 1893, including twenty-nine papers relating to the economy and life habits of insects.

ADDRESS LIST OF THE AGRICULTURAL EXPERIMENT STATIONS.—Circular No. 24, Office of Experiment Stations. Gives the postoffice addresses of the Agricultural Experiment Stations in the United States, together with the names and titles of the officers in charge.

SYNOPSIS OF CROP REPORT NO. 111, Division of Statistics. A summarized report of the average prices of the principal agricultural products of the United States and of the condition of winter wheat and rye.

KEY TO SUBJECT INDEX OF AGRICULTURAL LITERATURE. — Circular No. 23, Office of Experiment Stations. A key to the subject index of the literature of Agricultural Experiment Stations and kindred institutions.

AGRICULTURAL CHEMISTRY. — Proceedings of the Tenth Annual Convention of the Association of Official Agricultural Chemists held at Chicago, Ill., August 24-26, 1893. 238 pp. Bulletin No. 38, Division of Chemistry. Includes papers on methods of analyses of commercial fertilizers, feeds and feeding stuffs, dairy products, fermented liquors, and sugars, and discussions of the same by members of the association.

EXPERIMENT STATION RECORD, VOL. IV., NO. 12.—Pp. 995-1,086. Consists of an author and subject index and a table of contents for the volume.

Dorset Horn Sheep.—The third annual meeting of the Dorset Horn Sheep Breeders' Association of America, was held at the Fifth Avenue Hotel, New York City, December 28, 1893. At the annual banquet Dorset lamb was served, furnished by Mr. F. H. Turkington, of Connecticut. After dinner addresses were delivered by Wm. E. Kimsey, of Indiana, subject, "Our Lady Members;" Col. J. L. Henderson, of Pennsylvania, "Are Dorsets Dogproof?" J. M. Ham, of New York, "The Dorset as a Mutton Lamb." The annual report was made by the secretary, M. A. Cooper, of Washington, Penn.

University Extension Agricultural Lectures.—The University of Illinois has arranged for the delivery of twenty lectures on agricultural topics, with reference to stock rearing and dairying, general farming and fruit growing at Mt. Vernon, Ill., Feb. 12 to 16, 1894. These lectures will be by members of the faculty of the College of Agriculture and of the Agricultural Experiment Station staff. They will be given in five courses of four lectures each, as follows: The Soil—its origin, composition, uses, physical properties, cultivation, manuring; Diseases of Farm Animals — causes, symptoms, prevention, treatment; Farm Animals—breeds, breeding, feeding, management; Milk—composition, testing, cream separation, churning; American Agriculture—its history, characteristics, condition, prospects; Fruit Growing—its methods and aims. The lectures will be illustrated with experiments, stereopticon views and charts. There will be a good collection of books and periodicals treating of the subjects discussed, available for reference. There will be no fee or charge of any kind to those in attendance. For information concerning local arrangements, address G. E. Morrow, Dean College of Agriculture, Champaign, Ill. The College of Agriculture also offers a free short course in agriculture at the university, January 1 to March 20, 1894.

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THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST

MATTERS OF BUSINESS.

Final Estimates on the Year's Crops.

The statistician of the United States Department of Agriculture has completed his final estimates of the acreage devoted to the staple crops in 1893, the average yield per acre and the total product. It is understood that, in addition to reports from the Department's regular correspondents, considerable pains has been taken to verify discrepancies and make use where possible of the more exact basis afforded by the census of 1890.

The Greatest Crop of All is, as usual, our wealth of maize or Indian corn, which is now finally estimated at 1,619,496,361 bushels, against the AMERICAN AGRICULTURIST'S estimate (Page 534 last volume)—based on returns of condition up to August 20th — of 1,600,000,000 bushels. This is about 100 million bushels less than an average crop. The yield per acre, 22.5 bushels, is two and one-half bushels below the standard average. The breadth of corn was about a million acres below the average of the three previous years, but was about an even 1,500,000 acres more than the average in corn during the ninth decade. Acreage is the only true basis of comparison, because yield is so much influenced by season and culture. Taking the year of smallest area of corn since 1879, the season of largest breadth, the averages for ten years, 1880-9, and three years, 1890-2, we make this interesting comparison of the corn crop:

Crop.	Millions of			Av per Acre		Val
Year.	Ac'es	Bush	V'lue	Bush	V'lue	pr bu
1880	62	1,717	$680	27.6	$10.91	39.6c
1889	78	2,113	598	27.0	7.63	28.3
1890	72	1,490	754	20.7	10.48	50.6
1891	76	2,060	836	27.0	10.98	40.6
1892	71	1,628	642	23.I	9.09	39.4
1893	72	1,620	599	22.5	8.33	37.
Ave. '80-9	71	1,703	$669	24.1	$ 9.48	39.3 c
Ave. '90-2	73	1,726	744	23.7	10.21	43.1

The Decline in Wheat values has been terrible, the '93 crop netting the farmers an average for the whole United States of only 52 cents per bushel, a decline of 16 per cent. in one year, and nearly 50 per cent. below the average price for the previous three years. Hence it is that last year's wheat crop represents the smallest total value in many years, and is only about one-third the aggregate value of our maize! The final official estimate of 396,131,725 bushels is considerably below the AMERICAN AGRICULTURIST'S estimate (given September 12th), of "but 420,000,000 bushels." The average return to the husbandmen has been only some six dollars per acre, out of which must be paid harvesting, threshing, interest, taxes and seed, before the farmer comes in for his share for labor of growing the crop. With highest, lowest and average acreage as the basis, the following comparison is intensely interesting:

Crop.	Millions of			Av per Acre		Val
Year.	Ac'es	Bush	V'lue	Bush	V'lue	pr bu
1884	39	513	$331	13.0	$ 8.38	64.5 c
1885	34	357	275	10.4	8.05	77.1
1890	36	399	335	11.1	9.28	83.8
1891	40	612	513	15.3	12.86	83.9
1892	39	516	322	13.4	8.35	62.4
1893	35	396	206	11.4	5.93	52.0
1880-9	37	450	$372	12.1	$ 9.97	82.7 c
1890-2	38	509	390	13.3	10.21	76.6

In view of such a showing, it is remarkable that the Department returns indicate that the area sown to winter wheat the past fall in the United States is only seven per cent. less than in the previous year.

Barley has become a very important crop, its culture having been much stimulated by the high duties imposed on imported barley by the tariff of 1890. The land under barley last year was 3,220,371 acres, against only 2,200,000 acres in 1889. The crop is now 69,869,495 bushels, against only 55,000,000 then—a gain of 27 per cent. The yield per acre was 21.7 bushels last year, of an average value of 41 cents, or a gross return per acre of $8.90. This is a larger cash value per acre than of either wheat, corn or oats. Imports of barley have practically ceased, averaging about 1,500,000 bushels annually for the past three years, as against 12,000,000 bushels a year, or eight times as much, prior to 1890. Barley has been slowly gaining in popularity for twenty years, the acreage of 1889 being nearly two-thirds more and the product 75 per cent. more than at the opening of that decade. The crop is moving west, Iowa and Wisconsin having a much larger breadth than the 350,000 acres usually devoted to barley in New York State, California and Minnesota having quite as much, while the area in the Northwest has increased very rapidly of late.

The Oat Crop has gained in the breadth of land devoted to it, and though the yield per acre is slightly less than in recent years, the total crop is a fair average, considering the unfavorable season. In gross value it is almost up to the wheat crop. In returns per acre it shows a larger sum than wheat, while the cost of production is very much less. The AMERICAN AGRICULTURIST for September estimated the crop at 620,000,000 bushels, or within a bare fraction of the quantity officially verified and announced five months later. The 1893 oat crop compares with the smallest, largest and average crops as follows:

Crop.	Millions of			Av per Acre		Val
Year.	Ac'es	Bush	V'lue	Bush	V'lue	pr bu
1880	16	418	$150	25.8	$9.28	36.0c
1889	28	752	172	27.4	6.26	22.9
1890	26	524	222	19.8	8.40	42.4
1891	26	738	232	28.9	9.08	31.5
1892	27	661	209	24.4	7.73	31.7
1893	27	639	185	23.4	6.85	29.0
1880-9	22	584	$181	26.6	8.22	30.9c
1890-2	26	641	221	24.3	8.39	34.5

Buckwheat has the distinction of being the one grain that has advanced in price since harvest. Only 815,614 acres were devoted to this crop last season, yielding 14.9 bushels, or a total of 12,132,311 bushels. The census reported the buckwheat crop of 1889 at 17,575,000 bushels, grown on fully 1,200,000 acres, which suggests that the Department's estimate for the last crop is much below the facts. For sixty years nearly two-thirds of the buckwheat crop of the country has been produced in New York and Pennsylvania, and they grow relatively as large a proportion of this crop now as half a century ago when the total product was only 7,300,000 bushels. Michigan and Wisconsin come next.

The Humble Rye is returned as having been grown on 2,038,585 acres last year, yielding the usual 13 bushels per acre, or a product of 25,555,446 bushels. The census placed the crop of '89 at about the same figures for both product and area. The crop is only half again as large as it was 50 years ago, and one-fourth of the average is in New York, Pennsylvania and Wisconsin. The European famine led the United States to export several million bushels of rye a couple of years ago, which gave an impetus to the crop. There is no reason why it should not be more largely produced for both home use and export. Pennsylvania is the greatest rye producer with 340,000 acres, New York 240,000, Wisconsin 275,000, Kansas 200,000, Michigan 150,000, Iowa 100,000, followed by New Jersey with 75,000 acres of rye, and quite a number of States with 50,000 acres.

The Potato Product of 1893 is finally placed by the Department of Agriculture at 183,034,203 bushels, or an average of 72.2 bushels on 2,605,186 acres. This was rather more than the AMERICAN AGRICULTURIST'S August estimate of 165 million bushels. The breadth was nearly 400,000 acres more than in 1892, when the average yield was only 68 bushels, and the the wheat crop 150 millions, against 94 bushels in 1891 on nearly as many acres as last year, making a crop that year of 240 millions, which was the largest in our history. It caused prices to drop to 37 cents per bushel at the farm as the United States average in December, while the '92 crop sold at 67 cents, and the last crop was returned at 60 cents. Thus the return per acre for the past three years has been $43, $45 and $36 respectively. The last crop represents a total value of $110,000,000, or $20,000,000 more than the famous crop of '91.

The Yield of Tobacco is returned at 687 pounds on 702,954 acres, or a total of 483,023,953 pounds—very close in other respects to the accepted date for the '92 crop. The census returned the '89 crop at 488,256,000 pounds, an average of 705 pounds on 693,000 acres, grown by 206,000 planters, and representing a value of $35,000,000. The market for heavy and plug leaf is in good heart, at fair prices; but for domestic cigar leaf there is very little call by manufacturers except for immediate wants. There have been very few sales of cigar leaf by growers since January, 1893, as all are waiting to see what will be done about the tariff. Meanwhile 6,000,000 pounds of Sumatra wrappers are in Government warehouses, equal to an entire New England crop in wrapping capacity.

The Hop Trade has been comparatively steady ever since the market for the new crop opened in September. Brewers in Europe are now buying more freely, and prices at home and abroad show a distinct upward tendency, with 20 to 23 cents per pound as the price of New York growers from January 1st to 15th. Germany has no hops to export, and has been buying direct from America—an almost unprecedented event. The most conservative estimates confirm the returns of a world's shortage, first announced in August by the *New York Homestead*, of Syracuse., N. Y., the authority on this crop.

Personal, Commercial and Agricultural.

A Salary, with expenses paid, will come handy to anyone who is now out of employment, especially where no previous experience is required to get the position. If you want a position, read advertisement on Page 99, headed "A Chance to Make Money."

Well-Deserved Awards.—Information has just reached us that F. E. Myers & Bro., Ashland, Ohio, have received the highest awards and diplomas at the World's Fair for their Farm Force Pumps, Hay Carrier, Hay Carrier Track, Cyclone Tank Pumps, Spraying Pumps, and general display.

Acme.—Owing to the large increase in the demand throughout the West for the Acme pulverizing harrow, clod crusher and leveler, the manufacturer, Duane H. Nash, has been induced to open a branch house at No. 30 S. Canal street, Chicago, where he will be pleased to receive his friends.

Illustrated Swiss Calendar.—We have received a copy of the Illustrated Swiss Calendar by E. Lauterburg, Bern, Switzerland. It is handsome, and artistically gotten up. With each day of the year appears a different view of Swiss scenery, which is accompanied by interesting historical and geographical notes.

Superior Ensilage and Feed Cutters.—The Silver Mfg. Co., Salem, Ohio, issues a neat pamphlet illustrating and describing all the various feed cutters and carriers manufactured by this company. The pamphlet also contains a good deal of valuable information on the construction of silos and the management of ensilage.

The New Tree Remedy.—In Harris' Tree Healer, we have a very complete preparation for covering the wounds of trees resulting from pruning, or other causes. It is readily applied, and fully answers the requirements for which it is intended. Descriptive circulars may be obtained by addressing Geo. H. Harris, Long Branch, N. J.

Get Into Michigan.—There are few better places for farmers than the lands of Michigan. The soil is rich and loamy. There are good markets near by. The country is healthful—cyclones and blizzards don't come. Good society and churches abound. Terms—long time; low interest. Write O. M. Barnes, Land Commissioner, Lansing, Mich.

A Change of Base.—Chas. C. Stelle is now conducting, at 81 5th Ave., Brooklyn, N. Y., the old established sap spout business of C. C. Port, formerly located at Burlington, Vt. The spouts need no commendation from us. Their principal good point is a patent air trap which excludes the air, and, as a result, keeps the sap from freezing or drying up. Mr. Stelle's advertisement appears in this issue.

Pumps and Well Supplies.—The new catalogue of the Deming Co., Salem, Ohio, is a large handsome pamphlet full of illustrated descriptions of all imaginable iron and brass pumps—hand, windmill and power; hydraulic rams; artesian well brass cylinders; pump fixtures; well tools and supplies. This catalogue will be mailed to readers of the AMERICAN AGRICULTURIST who will apply for it.

High Grade Pencils.—A sample box of the leading grades of pencils manufactured by the Jos. Dixon Crucible Co., Jersey City, N. J., which was received at our office lately, has afforded a practical test of their excellent qualities with the result that all other kinds were at once discarded. If there are any better pencils manufactured anywhere, they have not come to our notice.

O. I. C.—This unique trademark has been widely and favorably known throughout the country. It has been adopted by the L. B. Silver Co., Cleveland, Ohio, for their Poland China, Berkshire, Duroc, and Chester pigs, for which it is claimed that they possess greater power to resist disease than other breeds. The Silver Live Stock Powder manufactured by this company is being constantly used by hundreds of farmers, who have tried it and who give their testimonies in the various circulars issued by this company.

The Whole Family.—Original stories of great interest, anecdotes, poems, the fashions, household and numerous other attractive departments combine to make *The Whole Family* one of our

(*Continued on Page* 112.)

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The Fall in Prices.

The ablest exponent of the free use of silver as money, A. J. Warner, writes a brief article in the New York *Sun* for January 10th clearly setting forth his reasons for attributing the fall in prices to silver legislation. He regards the repeal of the United States silver purchase law as the last act in the monetary revolution inaugurated by the demonetization of silver in 1873. Then the free coinage of silver was discontinued in the United States and Europe, while Italy, Spain, Holland, Norway and Sweden adopted the gold standard, followed by Austria-Hungary, India and the United States in 1893. Thus 350,000,000 people were in one year made competitors with gold-standard countries for gold for money supply. "No such change in the monetary condition of the world in so short a time ever took place before in all its history."

Mr. Warner believes that this has caused prices to fall by "doubling the value of the money standard, thereby halving the value of other property and produce." Organized labor has been able to resist in part this downward tendency, and agriculture has had to bear the brunt of it. Hence, the average value of our five great staple crops in 1893 was 48 per cent. less than in 1873, wheat has declined 54, cows 50, and cotton 62 per cent. If these crops of last season could have sold for the prices current twenty years ago, farmers would have received $1,500,100,000 more than they did.

Mr. Warner denies that this decline is due to cheaper methods of production and to improved machinery. He says farms have declined in similar proportions, and because farmers could not make both ends meet mortgages have been foreclosed, and "our whole system of agriculture is changing from small farm holdings to tenant farming." "The same processes are at work here as in Russia and Ireland—prices are declining, while debts and taxes remain the same." Consequently all other industries must come down to the farmer's level of profit, and hence he predicts a permanent decline in wages, rents and interest, and a depreciation of city real estate on a par with the decline in farm values. "With the United States, all Europe and now all India joining in the scramble for gold, its appreciation must go on faster and faster and prices must go the other way."

Mr. Warner holds that the only ones benefited are those who draw fixed salaries, and those whose property is in money or evidences of debt that call for a certain number of dollars, regardless of their value. The remedy, in his judgment, is universal free coinage of silver.

A Great Report.

Some familiarity with the great work of the Bureau of Statistics of the United States Treasury Department warrants us in directing particular attention to the efficiency with which the present chief, Worthington C. Ford, is conducting the work of the Bureau. His annual report upon the foreign commerce of the United States for the year ending June 30, 1893, is the clearest, most intelligible, and most complete statement of the kind ever issued from the government printing press. We indorse all that Mr. Ford says regarding the necessity of a larger force for the work of the Bureau, and trust that his very economical recommendations will be adopted by Congress.

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Catalogues Acknowledged.

F. BARTELDES & Co., Lawrence, Kas. Illustrated and descriptive catalogue of vegetable, flower and field seeds, small fruit plants and general nursery stock; also garden implements.

W. ATLEE BURPEE & Co., Philadelphia, Pa. Farm annual for 1894. This is a large, handsome pamphlet with several beautiful colored plates, and a large number of engravings illustrating a very complete list of all the best new and old vegetable, flower, and field crops and seeds which are herein offered. This pamphlet is not merely an enumeration of varieties but it gives excellent directions of the various operations necessary to successful gardening.

COLE'S SEED STORE, Pella, Iowa. A Garden Annual, being a descriptive and illustrated catalogue of all the best varieties of flower, vegetable, and field crops.

JAS. VICK'S SONS, Rochester, N. Y. Vick's Floral Guide. A very large, handsome, illustrated and descriptive catalogue of flower, vegetable, and field seeds, flowering bulbs and plants, small fruit plants, etc. Several very handsome colored plates embellish this pamphlet, which is fully up, if not superior to any of the Floral Guides published in former years.

STORRS & HARRISON Co., Painesville, Ohio: Catalogue of vegetable and flower seeds. Also bulbs and other flowering plants for garden and greenhouse. Roses are made the principal specialty; also small fruit plants, fruit and ornamental trees, etc. The catalogue is richly illustrated and handsomely gotten up.

MAPES FORMULA AND PERUVIAN GUANO Co., 143 Liberty street, New York City. The Mapes Manures and How to Use Them. A special pamphlet on fertilizers for Crops and Soils of Florida, giving a vast amount of information on manuring, cultivating, and taking care of special Florida crops.

S. L. ALLEN & Co., Philadelphia, Pa. A descriptive catalogue of the famous "Planet Jr." garden and field seed drills, cultivators, wheel hoes, etc., manufactured by this company.

T. J. DWYER, Cornwall, N. Y. Illustrated and descriptive catalogue of all the leading old and new kinds of small fruits; grapevines; fruit and ornamental trees; garden roots; vegetable plants.

JAMES J. H. GREGORY & SONS, Marblehead, Mass. Illustrated and descriptive catalogue of vegetable and flower seeds; also small flowering bulbs and plants, small fruits, garden implements, etc. This is a remarkably rich catalogue. The list of novelties comprises a number of highly promising varieties.

PETER HENDERSON & Co., 35 Cortlandt street, New York City. Manual of Everything for the Garden. In this handsome pamphlet the firm has exceeded its former endeavors in this line. The catalogue makes a large volume of 160 pages, replete with excellent illustrations of all the most important plants. It is also embellished with a number of grand colored plates. As its title, Everything for the Garden, implies, this catalogue enumerates and describes everything in the line of seeds; plants; trees and shrubs, useful and ornamental; implements, etc., which is needed in gardens, be they ever so small or ever so elaborate

JOSEPH HARRIS Co., Moreton Farm, Monroe Co., N. Y.: A handsome, illustrated and descriptive catalogue of field, garden and flower seeds, comprising all the most reliable old and new varieties; also small fruits, flowering plants, and various garden supplies.

H. A. MARCH, Fidalgo, Wash.: Price-list of March's Puget Sound cauliflower and cabbage seeds, together with many testimonials as to their good qualities.

E. E. MYERS & BRO., Ashland, Ohio.: Combination poster and calendar of pumps and hay tools, giving illustrations of all the various tools and pumps manufactured by this well-known firm.

PLANT SEED Co., St. Louis, Mo.: Descriptive and illustrated catalogue of seeds for the garden, farm, and field. This old and well-known house keeps fully abreast with the progress of the times, as is evidenced by their very full and complete catalogue.

POPE MFG. Co., Boston, Mass.: The Seventeenth Annual Greeting of the manufacturers of the Columbia bicycles; a remarkably handsome and artistically prepared pamphlet, printed on highly finished artist's proof, and giving a large number of illustrations of the various details and forms of the Columbian bicycle, together with a good deal of reading matter of special interest to cyclists.

GEO. H. CROLEY, No. 416 Sacramento St., San Francisco, Cal. Illustrated and descriptive catalogue of poultry, pigeons, dogs and pets, together with supplies of all kinds in these lines; also their principal eggs for hatching; also poultry and rural book publications. This being the midwinter fair edition, the puplisher has made special efforts to produce the most complete and handsome catalogue in this line which has ever been issued, and from examining the copy before us, we think he has succeeded with this beyond doubt.

VERMONT FARM MACHINE Co., Bellows Falls, Vt. Illustrated price list of special dairy and creamery supplies; Cooley creamers a specialty. List of important creamery apparatus, and complete equipment for creameries and private dairies; also catalogue of the Davis Swing Churn, butter workers, printers, carriers; also catalogue of the United States Cream Separator and Extractor; also catalogue of the Williams' Improved Patented Evaporators for maple sap, sorghum juice, and the making of cider jelly.

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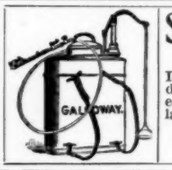

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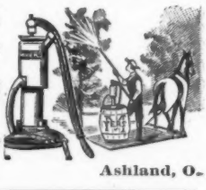

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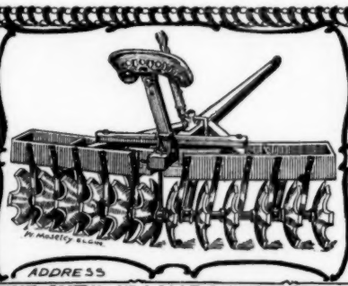

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MATTERS OF BUSINESS.

(*Continued from Page* 108.)

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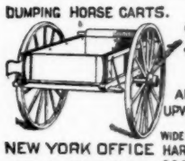

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MATTERS OF BUSINESS.

(*Continued from Page* 112.)

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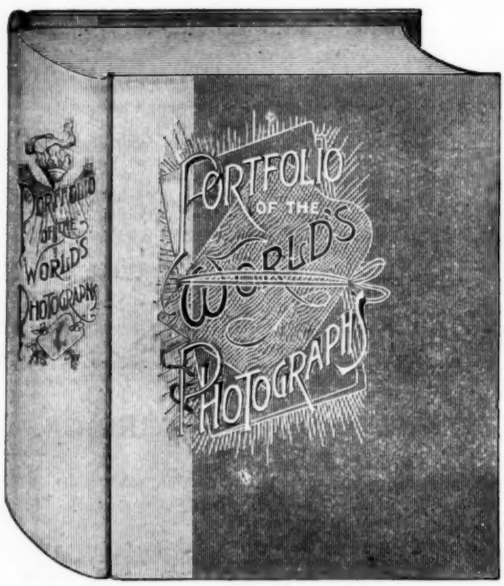

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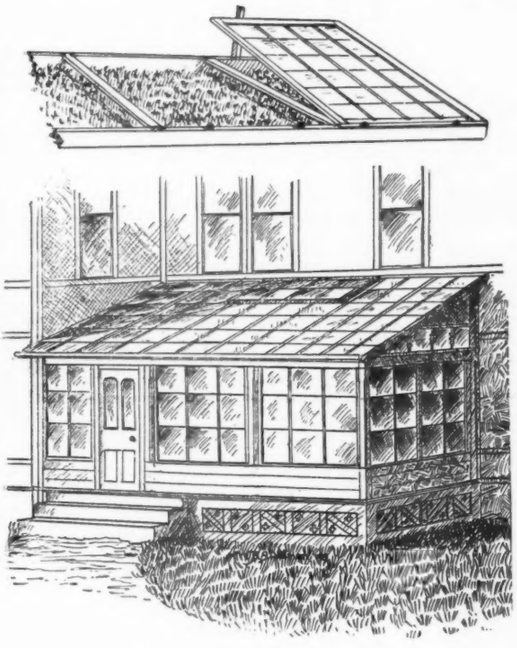

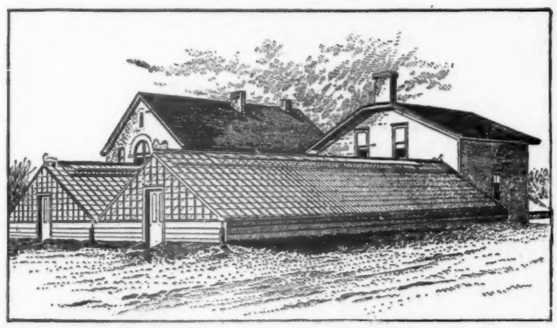

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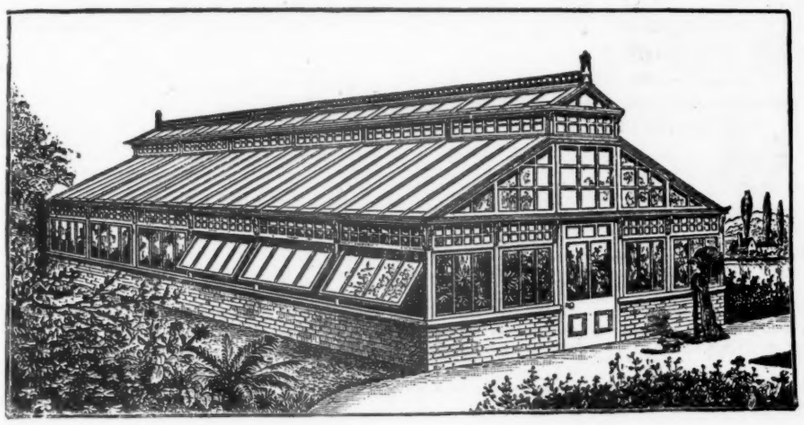

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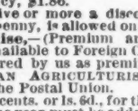

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